



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



Summary for Policymakers

Aviation and the Global Atmosphere

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A Special Report of IPCC Working Groups I and III

in collaboration with the

Scientific Assessment Panel to the Montreal Protocol
on Substances that Deplete the Ozone Layer

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Foreword

The Intergovernmental Panel on Climate Change (IPCC) was jointly established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988 to: (i) assess available information on the science, the impacts, and the economics of, and the options for mitigating and/or adapting to, climate change and (ii) provide, on request, scientific/technical/socio-economic advice to the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). Since then the IPCC has produced a series of Assessment Reports, Special Reports, Technical Papers, methodologies, and other products that have become standard works of reference, widely used by policymakers, scientists, and other experts.

This Special Report was prepared following a request from the International Civil Aviation Organization (ICAO) and the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. The state of understanding of the relevant science of the atmosphere, aviation technology, and socio-economic issues associated with mitigation options is assessed and reported for both subsonic and supersonic fleets. The potential effects that aviation has had in the past and may have in the future on both stratospheric ozone depletion and global climate change are covered; environmental impacts of aviation at the local scale, however, are not addressed. The report synthesizes the findings to identify and characterize options for mitigating future impacts.

As is usual in the IPCC, success in producing this report has depended first and foremost on the enthusiasm and cooperation of experts worldwide in many related but different disciplines.

G.O.P. Obasi

Secretary-General
World Meteorological Organization

We would like to express our gratitude to all the Coordinating Lead Authors, Lead Authors, Contributing Authors, Review Editors, and Expert Reviewers. These individuals have devoted enormous time and effort to produce this report and we are extremely grateful for their commitment to the IPCC process.

We would also like to express our sincere thanks to:

- Robert Watson, the Chairman of the IPCC and Co-Chair of the Scientific Assessment Panel to the Montreal Protocol
- John Houghton, Ding Yihui, Bert Metz, and Ogunlade Davidson—the Co-Chairs of IPCC Working Groups I and III
- Daniel Albritton, Co-Chair of the Scientific Assessment Panel to the Montreal Protocol
- David Lister and Joyce Penner, the Coordinators of this Special Report
- Daniel Albritton, John Crayston, Ogunlade Davidson, David Griggs, Neil Harris, John Houghton, Mack McFarland, Bert Metz, Nelson Sabogal, N. Sundararaman, Robert Watson, and Howard Wesoky—the Science Steering Committee for this Special Report
- David Griggs, David Dokken, and all the staff of the Working Group I and II Technical Support Units, including Mack McFarland, Richard Moss, Anne Murrill, Sandy MacCracken, Maria Noguer, Laura Van Wie McGrory, Neil Leary, Paul van der Linden, and Flo Ormond, and Neil Harris who provided additional help
- N. Sundararaman, the Secretary of the IPCC, and his staff, Rudie Bourgeois, Cecilia Tanikie, and Chantal Ettori.

K. Töpfer

Executive Director
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Preface

Following a request from the International Civil Aviation Organization (ICAO) to assess the consequences of greenhouse gas emissions from aircraft engines, the IPCC at its Twelfth Session (Mexico City, 11–13 September 1996) decided to produce this Special Report, *Aviation and the Global Atmosphere*, in collaboration with the Scientific Assessment Panel to the Montreal Protocol. The task was initially a joint responsibility between IPCC Working Groups I and II but, following a change in the terms of reference of the Working Groups (Thirteenth Session of the IPCC, Maldives, 22 and 25–28 September 1997), the responsibility was transferred to IPCC Working Groups I and III, with administrative support remaining with the Technical Support Units of Working Groups I and II.

Although it is less than 100 years since the first powered flight, the aviation industry has undergone rapid growth and has become an integral and vital part of modern society. In the absence of policy intervention, the growth is likely to continue. It is therefore highly relevant to consider the current and possible future effects of aircraft engine emissions on the atmosphere. A unique aspect of this report is the integral involvement of technical experts from the aviation industry, including airlines, and airframe and engine manufacturers, alongside atmospheric scientists. This involvement has been critical in producing what we believe is the most comprehensive assessment available to date of the effects of aviation on the global atmosphere. Although this Special Report is the first IPCC report to consider a particular industrial subsector, other sectors equally deserve study.

The report considers all the gases and particles emitted by aircraft into the upper atmosphere and the role that they play in modifying the chemical properties of the atmosphere and initiating the formation of condensation trails (contrails) and cirrus clouds. The report then considers (a) how the radiative properties of the atmosphere can be modified as a result, possibly leading to climate change, and (b) how the ozone layer could be modified, leading to changes in ultraviolet radiation reaching the Earth's surface. The report also considers how potential changes in aircraft technology, air transport operations, and the institutional, regulatory, and economic framework might affect emissions in the future. The report does not deal with the effects of engine emissions on local air quality near the surface.

The objective of this Special Report is to provide accurate, unbiased, policy-relevant information to serve the aviation industry and the expert and policymaking communities. The report, in describing the current state of knowledge, also identifies areas where our understanding is inadequate and where further work is urgently required. It does not make policy recommendations or suggest policy preferences, thus is consistent with IPCC practice.

This report was compiled by 107 Lead Authors from 18 countries. Successive drafts of the report were circulated for review by experts, followed by review of governments and experts. Over 100 Contributing Authors submitted draft text and information to the Lead Authors and over 150 reviewers submitted valuable suggestions for improvement during the review process. All the comments received were carefully analysed and assimilated into a revised document for consideration at the joint session of IPCC Working Groups I and III held in San José, Costa Rica, 12–14 April 1999. There, the Summary for Policymakers was approved in detail and the underlying report accepted.

We wish to express our sincere appreciation to the Report Coordinators, David Lister and Joyce Penner; to all the Coordinating Lead Authors, Lead Authors, and Review Editors whose expertise, diligence, and patience have underpinned the successful completion of this report; and to the many contributors and reviewers for their valuable and painstaking dedication and work. We thank the Steering Committee for their wise counsel and guidance throughout the preparation of the report. We are grateful to:

- ICAO for hosting the initial scoping meeting for the report and the final drafting meeting, and for translating the Summary for Policymakers into Arabic, Chinese, French, Russian, and Spanish (ICAO also provided technical inputs requested)
- The government of Trinidad and Tobago for hosting the first drafting meeting
- The International Air Transport Association (IATA) for hosting the second drafting meeting
- The government of Costa Rica for hosting the Joint Session of IPCC Working Groups I and III (San José, 12–14 April 1999), where the Summary for Policymakers was approved line by line and the underlying assessment accepted.

In particular, we are grateful to John Crayston (ICAO), Steve Pollonais (Government of Trinidad and Tobago), Leonie Dobbie (IATA), and Max Campos (government of Costa Rica) for their taking on the demanding burden of arranging for these meetings.

We also thank Anne Murrill of the Working Group I Technical Support Unit and Sandy MacCracken of the Working Group II Technical Support Unit for their tireless and good humored support throughout the preparation of the report. Other members of the Technical Support Units of Working Groups I and II also provided much assistance, including Richard Moss, Mack McFarland, Maria Noguera, Laura Van Wie McGrory, Neil Leary, Paul van der Linden, and Flo Ormond. The staff of the IPCC Secretariat, Rudie Bourgeois, Cecilia Tanikie, and

Chantal Etori, provided logistical support for all government liaison and travel of experts from the developing and transitional economy countries.

Robert Watson, IPCC Chairman

John Houghton, Co-Chair of IPCC Working Group I

Ding Yihui, Co-Chair of IPCC Working Group I

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SUMMARY FOR POLICYMAKERS

AVIATION AND THE GLOBAL ATMOSPHERE

A Special Report of Working Groups I and III of the Intergovernmental Panel on Climate Change

This summary, approved in detail at a joint session of IPCC Working Groups I and III (San José, Costa Rica, 12–14 April 1999), represents the formally agreed statement of the IPCC concerning current understanding of aviation and the global atmosphere.

Based on a draft prepared by:

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1. Introduction

This report assesses the effects of aircraft on climate and atmospheric ozone and is the first IPCC report for a specific industrial subsector. It was prepared by IPCC in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer, in response to a request by the International Civil Aviation Organization (ICAO)¹ because of the potential impact of aviation emissions. These are the predominant anthropogenic emissions deposited directly into the upper troposphere and lower stratosphere.

Aviation has experienced rapid expansion as the world economy has grown. Passenger traffic (expressed as revenue passenger-kilometres²) has grown since 1960 at nearly 9% per year, 2.4 times the average Gross Domestic Product (GDP) growth rate. Freight traffic, approximately 80% of which is carried by passenger airplanes, has also grown over the same time period. The rate of growth of passenger traffic has slowed to about 5% in 1997 as the industry is maturing. Total aviation emissions have increased, because increased demand for air transport has outpaced the reductions in specific emissions³ from the continuing improvements in technology and operational procedures. Passenger traffic, assuming unconstrained demand, is projected to grow at rates in excess of GDP for the period assessed in this report.

The effects of current aviation and of a range of unconstrained growth projections for aviation (which include passenger, freight, and military) are examined in this report, including the possible effects of a fleet of second generation, commercial supersonic aircraft. The report also describes current aircraft technology, operating procedures, and options for mitigating aviation's future impact on the global atmosphere. The report does not consider the local environmental effects of aircraft engine emissions or any of the indirect environmental effects of aviation operations such as energy usage by ground transportation at airports.

2. How Do Aircraft Affect Climate and Ozone?

Aircraft emit gases and particles directly into the upper troposphere and lower stratosphere where they have an impact on atmospheric composition. These gases and particles alter the concentration of atmospheric greenhouse gases, including carbon dioxide (CO₂), ozone (O₃), and methane (CH₄); trigger formation of condensation trails (contrails); and may increase cirrus cloudiness—all of which contribute to climate change (see Box on page 4).

The principal emissions of aircraft include the greenhouse gases carbon dioxide and water vapour (H₂O). Other major emissions are nitric oxide (NO) and nitrogen dioxide (NO₂) (which together are termed NO_x), sulfur oxides (SO_x), and soot. The total amount of aviation fuel burned, as well as the total emissions of carbon dioxide, NO_x, and water vapour by aircraft, are well known relative to other parameters important to this assessment.

The climate impacts of the gases and particles emitted and formed as a result of aviation are more difficult to quantify than the emissions; however, they can be compared to each other and to climate effects from other sectors by using the concept of radiative forcing.⁴ Because carbon dioxide has a long atmospheric residence time (≈100 years) and so becomes well mixed throughout the atmosphere, the effects of its emissions from aircraft are indistinguishable from the same quantity of carbon dioxide emitted by any other source. The other gases (e.g., NO_x, SO_x, water vapour) and particles have shorter atmospheric residence times and remain concentrated near flight routes, mainly in the northern mid-latitudes. These emissions can lead to radiative forcing that is regionally located near the flight routes for some components (e.g., ozone and contrails) in contrast to emissions that are globally mixed (e.g., carbon dioxide and methane).

The global mean climate change is reasonably well represented by the global average radiative forcing, for example, when evaluating the contributions of aviation to the rise in globally averaged temperature or sea level. However, because some of aviation's key contributions to radiative forcing are located mainly in the northern mid-latitudes, the regional climate response may differ from that derived from a global mean radiative forcing. The impact of aircraft on regional climate could be important, but has not been assessed in this report.

Ozone is a greenhouse gas. It also shields the surface of the Earth from harmful ultraviolet (UV) radiation, and is a common air pollutant. Aircraft-emitted NO_x participates in ozone chemistry. Subsonic aircraft fly in the upper troposphere and lower stratosphere (at altitudes of about 9 to 13 km), whereas supersonic aircraft cruise several kilometres higher (at about 17 to 20 km) in the stratosphere. Ozone in the upper troposphere and lower stratosphere is expected to increase in response to NO_x increases and methane is expected to decrease. At higher altitudes, increases in NO_x lead to decreases in the stratospheric ozone layer. Ozone precursor (NO_x) residence times in these regions increase with altitude, and hence perturbations to ozone by aircraft depend on the altitude of NO_x injection and vary from regional in scale in the troposphere to global in scale in the stratosphere.

¹ ICAO is the United Nations specialized agency that has global responsibility for the establishment of standards, recommended practices, and guidance on various aspects of international civil aviation, including environmental protection.

² The revenue passenger-km is a measure of the traffic carried by commercial aviation: one revenue-paying passenger carried 1 km.

³ Specific emissions are emissions per unit of traffic carried, for instance, per revenue passenger-km.

⁴ Radiative forcing is a measure of the importance of a potential climate change mechanism. It expresses the perturbation or change to the energy balance of the Earth-atmosphere system in watts per square metre (Wm⁻²). Positive values of radiative forcing imply a net warming, while negative values imply cooling.

The Science of Climate Change

Some of the main conclusions of the Summary for Policymakers of Working Group I of the IPCC Second Assessment Report, published in 1995, which concerns the effects of all anthropogenic emissions on climate change, follow:

- Increases in greenhouse gas concentrations since pre-industrial times (i.e., since about 1750) have led to a positive radiative forcing of climate, tending to warm the surface of the Earth and produce other changes of climate.
- The atmospheric concentrations of the greenhouse gases carbon dioxide, methane, and nitrous oxide (N_2O), among others, have grown significantly: by about 30, 145, and 15%, respectively (values for 1992). These trends can be attributed largely to human activities, mostly fossil fuel use, land-use change, and agriculture.
- Many greenhouse gases remain in the atmosphere for a long time (for carbon dioxide and nitrous oxide, many decades to centuries). As a result of this, if carbon dioxide emissions were maintained at near current (1994) levels, they would lead to a nearly constant rate of increase in atmospheric concentrations for at least two centuries, reaching about 500 ppmv (approximately twice the pre-industrial concentration of 280 ppmv) by the end of the 21st century.
- Tropospheric aerosols resulting from combustion of fossil fuels, biomass burning, and other sources have led to a negative radiative forcing, which, while focused in particular regions and subcontinental areas, can have continental to hemispheric effects on climate patterns. In contrast to the long-lived greenhouse gases, anthropogenic aerosols are very short-lived in the atmosphere; hence, their radiative forcing adjusts rapidly to increases or decreases in emissions.
- Our ability from the observed climate record to quantify the human influence on global climate is currently limited because the expected signal is still emerging from the noise of natural variability, and because there are uncertainties in key factors. These include the magnitude and patterns of long-term natural variability and the time-evolving pattern of forcing by, and response to, changes in concentrations of greenhouse gases and aerosols, and land-surface changes. Nevertheless, the balance of evidence suggests that there is a discernible human influence on global climate.
- The IPCC has developed a range of scenarios, IS92a-f, for future greenhouse gas and aerosol precursor emissions based on assumptions concerning population and economic growth, land use, technological changes, energy availability, and fuel mix during the period 1990 to 2100. Through understanding of the global carbon cycle and of atmospheric chemistry, these emissions can be used to project atmospheric concentrations of greenhouse gases and aerosols and the perturbation of natural radiative forcing. Climate models can then be used to develop projections of future climate.
- Estimates of the rise in global average surface air temperature by 2100 relative to 1990 for the IS92 scenarios range from 1 to 3.5°C. In all cases the average rate of warming would probably be greater than any seen in the last 10 000 years. Regional temperature changes could differ substantially from the global mean and the actual annual to decadal changes would include considerable natural variability. A general warming is expected to lead to an increase in the occurrence of extremely hot days and a decrease in the occurrence of extremely cold days.
- Average sea level is expected to rise as a result of thermal expansion of the oceans and melting of glaciers and ice-sheets. Estimates of the sea level rise by 2100 relative to 1990 for the IS92 scenarios range from 15 to 95 cm.
- Warmer temperatures will lead to a more vigorous hydrological cycle; this translates into prospects for more severe droughts and/or floods in some places and less severe droughts and/or floods in other places. Several models indicate an increase in precipitation intensity, suggesting a possibility for more extreme rainfall events.

Water vapour, SO_x (which forms sulfate particles), and soot⁵ play both direct and indirect roles in climate change and ozone chemistry.

3. How are Aviation Emissions Projected to Grow in the Future?

Global passenger air travel, as measured in revenue passenger-km, is projected to grow by about 5% per year between 1990 and 2015, whereas total aviation fuel use—including passenger, freight, and military⁶—is projected to increase by 3% per year, over the same period, the difference being due largely to improved aircraft efficiency. Projections beyond this time are more

uncertain so a range of future unconstrained emission scenarios is examined in this report (see Table 1 and Figure 1). All of these scenarios assume that technological improvements leading to reduced emissions per revenue passenger-km will continue in the future and that optimal use of airspace availability (i.e.,

⁵ Airborne sulfate particles and soot particles are both examples of aerosols. Aerosols are microscopic particles suspended in air.

⁶ The historical breakdown of aviation fuel burn for civil (passenger plus cargo) and military aviation was 64 and 36%, respectively, in 1976, and 82 and 18%, respectively, in 1992. These are projected to change to 93 and 7%, respectively, in 2015, and to 97 and 3%, respectively, in 2050.

Table 1: Summary of future global aircraft scenarios used in this report.

Scenario name	Avg. traffic growth per year (1990–2050) ¹	Avg. annual growth rate of fuel burn (1990–2050) ²	Avg. annual economic growth rate	Avg. annual population growth rate	Ratio of traffic (2050/1990)	Ratio of fuel burn (2050/1990)	Notes
Fa1	3.1%	1.7%	2.9% 1990–2025 2.3% 1990–2100	1.4% 1990–2025 0.7% 1990–2100	6.4	2.7	Reference scenario developed by ICAO Forecasting and Economic Support Group (FESG); mid-range economic growth from IPCC (1992); technology for both improved fuel efficiency and NO _x reduction
Fa1H	3.1%	2.0%	2.9% 1990–2025 2.3% 1990–2100	1.4% 1990–2025 0.7% 1990–2100	6.4	3.3	Fa1 traffic and technology scenario with a fleet of supersonic aircraft replacing some of the subsonic fleet
Fa2	3.1%	1.7%	2.9% 1990–2025 2.3% 1990–2100	1.4% 1990–2025 0.7% 1990–2100	6.4	2.7	Fa1 traffic scenario; technology with greater emphasis on NO _x reduction, but slightly smaller fuel efficiency improvement
Fc1	2.2%	0.8%	2.0% 1990–2025 1.2% 1990–2100	1.1% 1990–2025 0.2% 1990–2100	3.6	1.6	FESG low-growth scenario; technology as for Fa1 scenario
Fe1	3.9%	2.5%	3.5% 1990–2025 3.0% 1990–2100	1.4% 1990–2025 0.7% 1990–2100	10.1	4.4	FESG high-growth scenario; technology as for Fa1 scenario
Eab	4.0%	3.2%			10.7	6.6	Traffic-growth scenario based on IS92a developed by Environmental Defense Fund (EDF); technology for very low NO _x assumed
Edh	4.7%	3.8%			15.5	9.4	High traffic-growth EDF scenario; technology for very low NO _x assumed

¹Traffic measured in terms of revenue passenger-km.²All aviation (passenger, freight, and military).

ideal air traffic management) is achieved by 2050. If these improvements do not materialize then fuel use and emissions will be higher. It is further assumed that the number of aircraft as well as the number of airports and associated infrastructure will continue to grow and not limit the growth in demand for air travel. If the infrastructure was not available, the growth of traffic reflected in these scenarios would not materialize.

IPCC (1992)⁷ developed a range of scenarios, IS92a–f, of future greenhouse gas and aerosol precursor emissions based on assumptions concerning population and economic growth,

land use, technological changes, energy availability, and fuel mix during the period 1990 to 2100. Scenario IS92a is a mid-range emissions scenario. Scenarios of future emissions are not predictions of the future. They are inherently uncertain because they are based on different assumptions about the future, and

⁷ IPCC, 1992: *Climate Change 1992: The Supplementary Report to the IPCC Scientific Assessment* [Houghton, J.T., B.A. Callander, and S.K. Varney (eds.)]. Cambridge University Press, Cambridge, UK, 200 pp.

the longer the time horizon the more uncertain these scenarios become. The aircraft emissions scenarios developed here used the economic growth and population assumptions found in the IS92 scenario range (see Table 1 and Figure 1). In the following sections, scenario Fa1 is utilized to illustrate the possible effects of aircraft and is called the reference scenario. Its assumptions are linked to those of IS92a. The other aircraft emissions scenarios were built from a range of economic and population projections from IS92a-e. These scenarios represent a range of plausible growth for aviation and provide a basis for sensitivity analysis for climate modeling. However, the high growth scenario Edh is believed to be less plausible and the low growth scenario Fc1 is likely to be exceeded given the present state of the industry and planned developments.

4. What are the Current and Future Impacts of Subsonic Aviation on Radiative Forcing and UV Radiation?

The summary of radiative effects resulting from aircraft engine emissions is given in Figures 2 and 3. As shown in Figure 2, the uncertainty associated with several of these effects is large.

4.1 Carbon Dioxide

Emissions of carbon dioxide by aircraft were 0.14 Gt C/year in 1992. This is about 2% of total anthropogenic carbon dioxide emissions in 1992 or about 13% of carbon dioxide emissions from all transportation sources. The range of scenarios considered here projects that aircraft emissions of carbon dioxide will continue to grow and by 2050 will be 0.23 to 1.45 Gt C/year. For the reference scenario (Fa1) this emission increases 3-fold

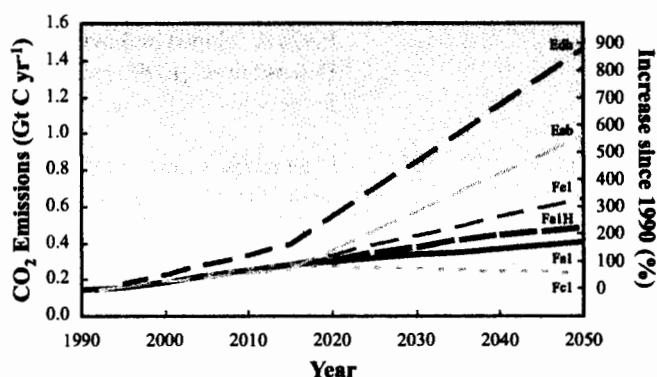


Figure 1: Total aviation carbon dioxide emissions resulting from six different scenarios for aircraft fuel use. Emissions are given in Gt C [or billion (10^9) tonnes of carbon] per year. To convert Gt C to Gt CO_2 multiply by 3.67. The scale on the righthand axis represents the percentage growth from 1990 to 2050. Aircraft emissions of carbon dioxide represent 2.4% of total fossil fuel emissions of carbon dioxide in 1992 or 2% of total anthropogenic carbon dioxide emissions. (Note: Fa2 has not been drawn because the difference from scenario Fa1 would not be discernible on the figure.)

by 2050 to 0.40 Gt C/year, or 3% of the projected total anthropogenic carbon dioxide emissions relative to the mid-range IPCC emission scenario (IS92a). For the range of scenarios, the range of increase in carbon dioxide emissions to 2050 would be 1.6 to 10 times the value in 1992.

Concentrations of and radiative forcing from carbon dioxide today are those resulting from emissions during the last 100 years or so. The carbon dioxide concentration attributable to aviation in the 1992 atmosphere is 1 ppmv, a little more than 1% of the total anthropogenic increase. This percentage is lower than the percentage for emissions (2%) because the emissions occurred only in the last 50 years. For the range of scenarios in Figure 1, the accumulation of atmospheric carbon dioxide due to aircraft over the next 50 years is projected to increase to 5 to 13 ppmv. For the reference scenario (Fa1) this is 4% of that from all human activities assuming the mid-range IPCC scenario (IS92a).

4.2 Ozone

The NO_x emissions from subsonic aircraft in 1992 are estimated to have increased ozone concentrations at cruise altitudes in northern mid-latitudes by up to 6%, compared to an atmosphere without aircraft emissions. This ozone increase is projected to rise to about 13% by 2050 in the reference scenario (Fa1). The impact on ozone concentrations in other regions of the world is substantially less. These increases will, on average, tend to warm the surface of the Earth.

Aircraft emissions of NO_x are more effective at producing ozone in the upper troposphere than an equivalent amount of emission at the surface. Also increases in ozone in the upper troposphere are more effective at increasing radiative forcing than increases at lower altitudes. Due to these increases the calculated total ozone column in northern mid-latitudes is projected to grow by approximately 0.4 and 1.2% in 1992 and 2050, respectively. However, aircraft sulfur and water emissions in the stratosphere tend to deplete ozone, partially offsetting the NO_x -induced ozone increases. The degree to which this occurs is, as yet, not quantified. Therefore, the impact of subsonic aircraft emissions on stratospheric ozone requires further evaluation. The largest increases in ozone concentration due to aircraft emissions are calculated to occur near the tropopause where natural variability is high. Such changes are not apparent from observations at this time.

4.3 Methane

In addition to increasing tropospheric ozone concentrations, aircraft NO_x emissions are expected to decrease the concentration of methane, which is also a greenhouse gas. These reductions in methane tend to cool the surface of the Earth. The methane concentration in 1992 is estimated here to be about 2% less than that in an atmosphere without aircraft. This aircraft-induced reduction of methane concentration is much smaller than the observed overall 2.5-fold increase since pre-industrial

times. Uncertainties in the sources and sinks of methane preclude testing the impact of aviation on methane concentrations with atmospheric observations. In the reference scenario (Fa1) methane would be about 5% less than that calculated for a 2050 atmosphere without aircraft.

Changes in tropospheric ozone are mainly in the Northern Hemisphere, while those of methane are global in extent so that, even though the global average radiative forcings are of similar magnitude and opposite in sign, the latitudinal structure of the forcing is different so that the net regional radiative effects do not cancel.

4.4 Water Vapour

Most subsonic aircraft water vapour emissions are released in the troposphere where they are rapidly removed by precipitation

within 1 to 2 weeks. A smaller fraction of water vapour emissions is released in the lower stratosphere where it can build up to larger concentrations. Because water vapor is a greenhouse gas, these increases tend to warm the Earth's surface, though for subsonic aircraft this effect is smaller than those of other aircraft emissions such as carbon dioxide and NO_x .

4.5 Contrails

In 1992, aircraft line-shaped contrails are estimated to cover about 0.1% of the Earth's surface on an annually averaged basis with larger regional values. Contrails tend to warm the Earth's surface, similar to thin high clouds. The contrail cover is projected to grow to 0.5% by 2050 in the reference scenario (Fa1), at a rate which is faster than the rate of growth in aviation fuel consumption. This faster growth in contrail cover is expected because air traffic will increase mainly in the upper troposphere where contrails form preferentially, and may also occur as a result of improvements in aircraft fuel efficiency. Contrails are triggered from the water vapour emitted by aircraft and their optical properties depend on the particles emitted or formed in the aircraft plume and on the ambient atmospheric conditions. The radiative effect of contrails depends on their optical properties and global cover, both of which are uncertain. Contrails have been observed as line-shaped clouds

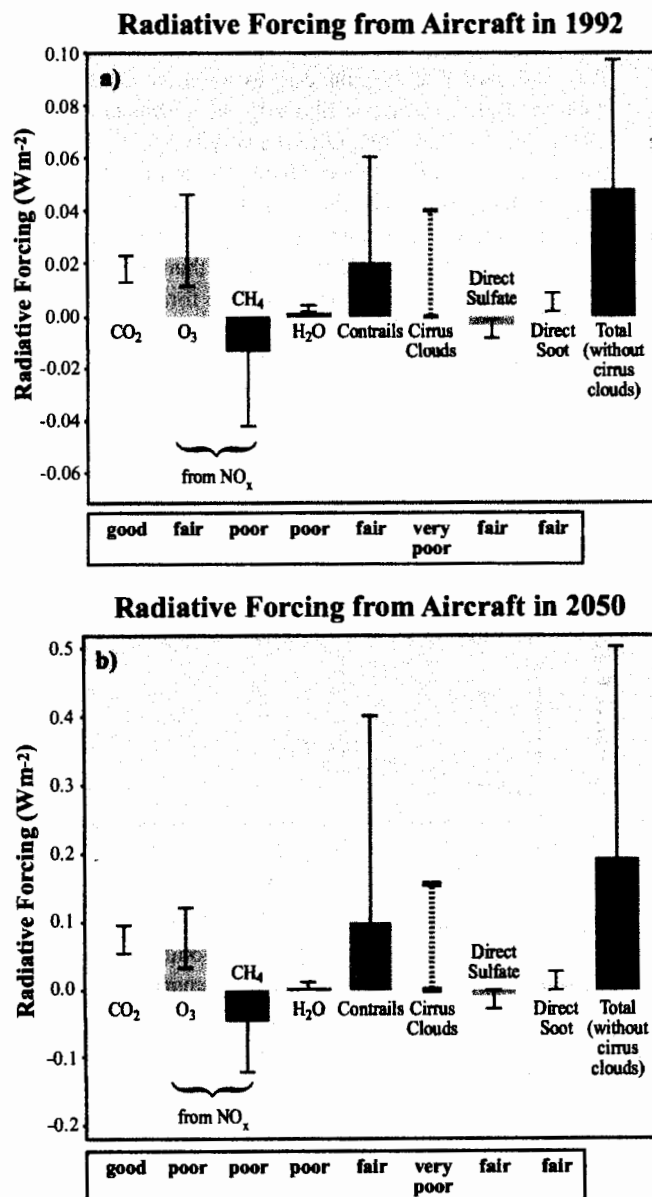


Figure 2: Estimates of the globally and annually averaged radiative forcing (Wm^{-2}) (see Footnote 4) from subsonic aircraft emissions in 1992 (2a) and in 2050 for scenario Fa1 (2b). The scale in Figure 2b is greater than the scale in 2a by about a factor of 4. The bars indicate the best estimate of forcing while the line associated with each bar is a two-thirds uncertainty range developed using the best knowledge and tools available at the present time. (The two-thirds uncertainty range means that there is a 67% probability that the true value falls within this range.) The available information on cirrus clouds is insufficient to determine either a best estimate or an uncertainty range; the dashed line indicates a range of possible best estimates. The estimate for total forcing does not include the effect of changes in cirrus cloudiness. The uncertainty estimate for the total radiative forcing (without additional cirrus) is calculated as the square root of the sums of the squares of the upper and lower ranges for the individual components. The evaluations below the graph ("good," "fair," "poor," "very poor") are a relative appraisal associated with each component and indicate the level of scientific understanding. It is based on the amount of evidence available to support the best estimate and its uncertainty, the degree of consensus in the scientific literature, and the scope of the analysis. This evaluation is separate from the evaluation of uncertainty range represented by the lines associated with each bar. This method of presentation is different and more meaningful than the confidence level presented in similar graphs from *Climate Change 1995: The Science of Climate Change*.

by satellites over heavy air traffic areas and covered on average about 0.5% of the area over Central Europe in 1996 and 1997.

4.6 Cirrus Clouds

Extensive cirrus clouds have been observed to develop after the formation of persistent contrails. Increases in cirrus cloud cover (beyond those identified as line-shaped contrails) are found to be positively correlated with aircraft emissions in a limited number of studies. About 30% of the Earth is covered with cirrus cloud. On average an increase in cirrus cloud cover tends to warm the surface of the Earth. An estimate for aircraft-induced cirrus cover for the late 1990s ranges from 0 to 0.2% of the surface of the Earth. For the Fa1 scenario, this may possibly increase by a factor of 4 (0 to 0.8%) by 2050; however, the mechanisms associated with increases in cirrus cover are not well understood and need further investigation.

4.7 Sulfate and Soot Aerosols

The aerosol mass concentrations in 1992 resulting from aircraft are small relative to those caused by surface sources. Although aerosol accumulation will grow with aviation fuel use, aerosol mass concentrations from aircraft in 2050 are projected to remain small compared to surface sources. Increases in soot tend to warm while increases in sulfate tend to cool the Earth's surface. The direct radiative forcing of sulfate and soot aerosols from aircraft is small compared to those of other aircraft emissions. Because aerosols influence the formation of clouds, the accumulation of aerosols from aircraft may play a role in enhanced cloud formation and change the radiative properties of clouds.

4.8 What are the Overall Climate Effects of Subsonic Aircraft?

The climate impacts of different anthropogenic emissions can be compared using the concept of radiative forcing. The best estimate of the radiative forcing in 1992 by aircraft is 0.05 Wm^{-2} or about 3.5% of the total radiative forcing by all anthropogenic activities. For the reference scenario (Fa1), the radiative forcing by aircraft in 2050 is 0.19 Wm^{-2} or 5% of the radiative forcing in the mid-range IS92a scenario (3.8 times the value in 1992). According to the range of scenarios considered here, the forcing is projected to grow to 0.13 to 0.56 Wm^{-2} in 2050, which is a factor of 1.5 less to a factor of 3 greater than that for Fa1 and from 2.6 to 11 times the value in 1992. These estimates of forcing combine the effects from changes in concentrations of carbon dioxide, ozone, methane, water vapour, line-shaped contrails, and aerosols, but do not include possible changes in cirrus clouds.

Globally averaged values of the radiative forcing from different components in 1992 and in 2050 under the reference scenario (Fa1) are shown in Figure 2. Figure 2 indicates the best

estimates of the forcing for each component and the two-thirds uncertainty range.⁸ The derivation of these uncertainty ranges involves expert scientific judgment and may also include objective statistical models. The uncertainty range in the radiative forcing stated here combines the uncertainty in calculating the atmospheric change to greenhouse gases and aerosols with that of calculating radiative forcing. For additional cirrus clouds, only a range for the best estimate is given; this is not included in the total radiative forcing.

The state of scientific understanding is evaluated for each component. This is not the same as the confidence level expressed in previous IPCC documents. This evaluation is separate from the uncertainty range and is a relative appraisal of the scientific understanding for each component. The evaluation is based on the amount of evidence available to support the best estimate and its uncertainty, the degree of consensus in the scientific literature, and the scope of the analysis. The total radiative forcing under each of the six scenarios for the growth of aviation is shown in Figure 3 for the period 1990 to 2050.

The total radiative forcing due to aviation (without forcing from additional cirrus) is likely to lie within the range from 0.01 to 0.1 Wm^{-2} in 1992, with the largest uncertainties coming from contrails and methane. Hence the total radiative forcing may be about two times larger or five times smaller than the best estimate. For any scenario at 2050, the uncertainty range of radiative forcing is slightly larger than for 1992, but the largest variations of projected radiative forcing come from the range of scenarios.

Over the period from 1992 to 2050, the overall radiative forcing by aircraft (excluding that from changes in cirrus

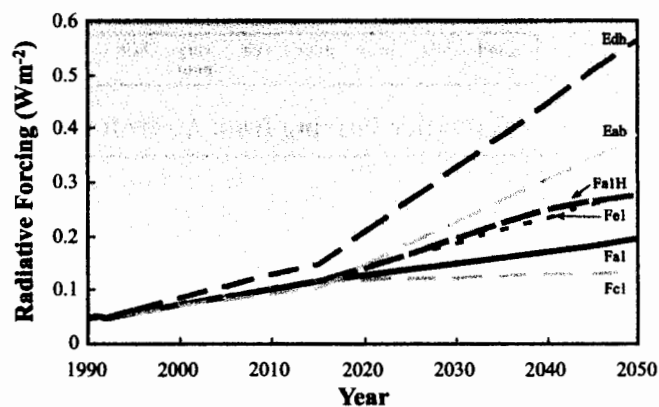


Figure 3: Estimates of the globally and annually averaged total radiative forcing (without cirrus clouds) associated with aviation emissions under each of six scenarios for the growth of aviation over the time period 1990 to 2050. (Fa2 has not been drawn because the difference from scenario Fa1 would not be discernible on the figure.)

⁸ The two-thirds uncertainty range means there is a 67% probability that the true value falls within this range.

clouds) for all scenarios in this report is a factor of 2 to 4 larger than the forcing by aircraft carbon dioxide alone. The overall radiative forcing for the sum of all human activities is estimated to be at most a factor of 1.5 larger than that of carbon dioxide alone.

The emissions of NO_x cause changes in methane and ozone, with influence on radiative forcing estimated to be of similar magnitude but of opposite sign. However, as noted above, the geographical distribution of the aircraft ozone forcing is far more regional than that of the aircraft methane forcing.

The effect of aircraft on climate is superimposed on that caused by other anthropogenic emissions of greenhouse gases and particles, and on the background natural variability. The radiative forcing from aviation is about 3.5% of the total radiative forcing in 1992. It has not been possible to separate the influence on global climate change of aviation (or any other sector with similar radiative forcing) from all other anthropogenic activities. Aircraft contribute to global change approximately in proportion to their contribution to radiative forcing.

4.9 What are the Overall Effects of Subsonic Aircraft on UV-B?

Ozone, most of which resides in the stratosphere, provides a shield against solar ultraviolet radiation. The erythemal dose rate, defined as UV irradiance weighted according to how effectively it causes sunburn, is estimated to be decreased by aircraft in 1992 by about 0.5% at 45°N in July. For comparison, the calculated increase in the erythemal dose rate due to observed ozone depletion is about 4% over the period 1970 to 1992 at 45°N in July.⁹ The net effect of subsonic aircraft appears to be an increase in column ozone and a decrease in UV radiation, which is mainly due to aircraft NO_x emissions. Much smaller changes in UV radiation are associated with aircraft contrails, aerosols, and induced cloudiness. In the Southern Hemisphere, the calculated effects of aircraft emission on the erythemal dose rate are about a factor of 4 lower than for the Northern Hemisphere.

For the reference scenario (Fa1), the change in erythemal dose rate at 45°N in July in 2050 compared to a simulation with no aircraft is -1.3% (with a two-thirds uncertainty range from -0.7 to -2.6%). For comparison, the calculated change in the erythemal dose rate due to changes in the concentrations of trace species, other than those from aircraft, between 1970 to 2050 at 45°N is about -3%, a decrease that is the net result of two opposing effects: (1) the incomplete recovery of stratospheric ozone to 1970 levels because of the persistence of long-lived halogen-containing compounds, and (2) increases in projected surface emissions of shorter lived pollutants that produce ozone in the troposphere.

⁹ This value is based on satellite observations and model calculations. See WMO, 1999: *Scientific Assessment of Ozone Depletion: 1998*, Report No. 44, Global Ozone Research and Monitoring Project, World Meteorological Organization, Geneva, Switzerland, 732 pp.

5. What are the Current and Future Impacts of Supersonic Aviation on Radiative Forcing and UV Radiation?

One possibility for the future is the development of a fleet of second generation supersonic, high speed civil transport (HSCT) aircraft, although there is considerable uncertainty whether any such fleet will be developed. These supersonic aircraft are projected to cruise at an altitude of about 19 km, about 8 km higher than subsonic aircraft, and to emit carbon dioxide, water vapour, NO_x , SO_x , and soot into the stratosphere. NO_x , water vapour, and SO_x from supersonic aircraft emissions all contribute to changes in stratospheric ozone. The radiative forcing of civil supersonic aircraft is estimated to be about a factor of 5 larger than that of the displaced subsonic aircraft in the Fa1H scenario. The calculated radiative forcing of supersonic aircraft depends on the treatment of water vapour and ozone in models. This effect is difficult to simulate in current models and so is highly uncertain.

Scenario Fa1H considers the addition of a fleet of civil supersonic aircraft that was assumed to begin operation in the year 2015 and grow to a maximum of 1 000 aircraft by the year 2040. For reference, the civil subsonic fleet at the end of the year 1997 contained approximately 12 000 aircraft. In this scenario, the aircraft are designed to cruise at Mach 2.4, and new technologies are assumed that maintain emissions of 5 g NO_2 per kg fuel (lower than today's civil supersonic aircraft which have emissions of about 22 g NO_2 per kg fuel). These supersonic aircraft are assumed to replace part of the subsonic fleet (11%, in terms of emissions in scenario Fa1). Supersonic aircraft consume more than twice the fuel per passenger-km compared to subsonic aircraft. By the year 2050, the combined fleet (scenario Fa1H) is projected to add a further 0.08 Wm^{-2} (42%) to the 0.19 Wm^{-2} radiative forcing from scenario Fa1 (see Figure 4). Most of this additional forcing is due to accumulation of stratospheric water vapour.

The effect of introducing a civil supersonic fleet to form the combined fleet (Fa1H) is also to reduce stratospheric ozone and increase erythemal dose rate. The maximum calculated effect is at 45°N where, in July, the ozone column change in 2050 from the combined subsonic and supersonic fleet relative to no aircraft is -0.4%. The effect on the ozone column of the supersonic component by itself is -1.3% while the subsonic component is +0.9%.

The combined fleet would change the erythemal dose rate at 45°N in July by +0.3% compared to the 2050 atmosphere without aircraft. The two-thirds uncertainty range for the combined fleet is -1.7% to +3.3%. This may be compared to the projected change of -1.3% for Fa1. Flying higher leads to larger ozone column decreases, while flying lower leads to smaller ozone column decreases and may even result in an ozone column increase for flight in the lowermost stratosphere. In addition, emissions from supersonic aircraft in the Northern Hemisphere stratosphere may be transported to the Southern Hemisphere where they cause ozone depletion.

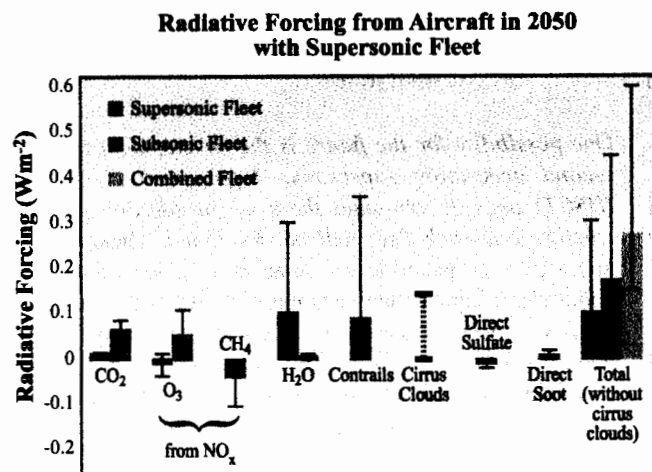


Figure 4: Estimates of the globally and annually averaged radiative forcing from a combined fleet of subsonic and supersonic aircraft (in Wm^{-2}) due to changes in greenhouse gases, aerosols, and contrails in 2050 under the scenario Fa1H. In this scenario, the supersonic aircraft are assumed to replace part of the subsonic fleet (11%, in terms of emissions in scenario Fa1). The bars indicate the best estimate of forcing while the line associated with each bar is a two-thirds uncertainty range developed using the best knowledge and tools available at the present time. (The two-thirds uncertainty range means that there is a 67% probability that the true value falls within this range.) The available information on cirrus clouds is insufficient to determine either a best estimate or an uncertainty range; the dashed line indicates a range of possible best estimates. The estimate for total forcing does not include the effect of changes in cirrus cloudiness. The uncertainty estimate for the total radiative forcing (without additional cirrus) is calculated as the square root of the sums of the squares of the upper and lower ranges. The level of scientific understanding for the supersonic components are carbon dioxide, "good;" ozone, "poor," and water vapour, "poor."

6. What are the Options to Reduce Emissions and Impacts?

There is a range of options to reduce the impact of aviation emissions, including changes in aircraft and engine technology, fuel, operational practices, and regulatory and economic measures. These could be implemented either singly or in combination by the public and/or private sector. Substantial aircraft and engine technology advances and the air traffic management improvements described in this report are already incorporated in the aircraft emissions scenarios used for climate change calculations. Other operational measures, which have the potential to reduce emissions, and alternative fuels were not assumed in the scenarios. Further technology advances have the potential to provide additional fuel and emissions reductions. In practice, some of the improvements are expected to take place for commercial reasons. The timing and scope of regulatory, economic, and other options may affect the introduction of improvements and may affect demand

for air transport. Mitigation options for water vapour and cloudiness have not been fully addressed.

Safety of operation, operational and environmental performance, and costs are dominant considerations for the aviation industry when assessing any new aircraft purchase or potential engineering or operational changes. The typical life expectancy of an aircraft is 25 to 35 years. These factors have to be taken into account when assessing the rate at which technology advances and policy options related to technology can reduce aviation emissions.

6.1 Aircraft and Engine Technology Options

Technology advances have substantially reduced most emissions per passenger-km. However, there is potential for further improvements. Any technological change may involve a balance among a range of environmental impacts.

Subsonic aircraft being produced today are about 70% more fuel efficient per passenger-km than 40 years ago. The majority of this gain has been achieved through engine improvements and the remainder from airframe design improvement. A 20% improvement in fuel efficiency is projected by 2015 and a 40 to 50% improvement by 2050 relative to aircraft produced today. The 2050 scenarios developed for this report already incorporate these fuel efficiency gains when estimating fuel use and emissions. Engine efficiency improvements reduce the specific fuel consumption and most types of emissions; however, contrails may increase and, without advances in combustor technology, NO_x emissions may also increase.

Future engine and airframe design involves a complex decision-making process and a balance of considerations among many factors (e.g., carbon dioxide emissions, NO_x emissions at ground level, NO_x emissions at altitude, water vapour emissions, contrail/cirrus production, and noise). These aspects have not been adequately characterized or quantified in this report.

Internationally, substantial engine research programmes are in progress, with goals to reduce Landing and Take-off cycle (LTO) emissions of NO_x by up to 70% from today's regulatory standards, while also improving engine fuel consumption by 8 to 10%, over the most recently produced engines, by about 2010. Reduction of NO_x emissions would also be achieved at cruise altitude, though not necessarily by the same proportion as for LTO. Assuming that the goals can be achieved, the transfer of this technology to significant numbers of newly produced aircraft will take longer—typically a decade. Research programmes addressing NO_x emissions from supersonic aircraft are also in progress.

6.2 Fuel Options

There would not appear to be any practical alternatives to kerosene-based fuels for commercial jet aircraft for the next

several decades. Reducing sulfur content of kerosene will reduce SO_x emissions and sulfate particle formation.

Jet aircraft require fuel with a high energy density, especially for long-haul flights. Other fuel options, such as hydrogen, may be viable in the long term, but would require new aircraft designs and new infrastructure for supply. Hydrogen fuel would eliminate emissions of carbon dioxide from aircraft, but would increase those of water vapour. The overall environmental impacts and the environmental sustainability of the production and use of hydrogen or any other alternative fuels have not been determined.

The formation of sulfate particles from aircraft emissions, which depends on engine and plume characteristics, is reduced as fuel sulfur content decreases. While technology exists to remove virtually all sulfur from fuel, its removal results in a reduction in lubricity.

6.3 Operational Options

Improvements in air traffic management (ATM) and other operational procedures could reduce aviation fuel burn by between 8 and 18%. The large majority (6 to 12%) of these reductions comes from ATM improvements which it is anticipated will be fully implemented in the next 20 years. All engine emissions will be reduced as a consequence. In all aviation emission scenarios considered in this report the reductions from ATM improvements have already been taken into account. The rate of introduction of improved ATM will depend on the implementation of the essential institutional arrangements at an international level.

Air traffic management systems are used for the guidance, separation, coordination, and control of aircraft movements. Existing national and international air traffic management systems have limitations which result, for example, in holding (aircraft flying in a fixed pattern waiting for permission to land), inefficient routings, and sub-optimal flight profiles. These limitations result in excess fuel burn and consequently excess emissions.

For the current aircraft fleet and operations, addressing the above-mentioned limitations in air traffic management systems could reduce fuel burned in the range of 6 to 12%. It is anticipated that the improvement needed for these fuel burn reductions will be fully implemented in the next 20 years, provided that the necessary institutional and regulatory arrangements have been put in place in time. The scenarios developed in this report assume the timely implementation of these ATM improvements, when estimating fuel use.

Other operational measures to reduce the amount of fuel burned per passenger-km include increasing load factors (carrying more passengers or freight on a given aircraft), eliminating non-essential weight, optimizing aircraft speed, limiting the use of auxiliary power (e.g., for heating, ventilation),

and reducing taxiing. The potential improvements in these operational measures could reduce fuel burned, and emissions, in the range 2 to 6%.

Improved operational efficiency may result in attracting additional air traffic, although no studies providing evidence on the existence of this effect have been identified.

6.4 Regulatory, Economic, and Other Options

Although improvements in aircraft and engine technology and in the efficiency of the air traffic system will bring environmental benefits, these will not fully offset the effects of the increased emissions resulting from the projected growth in aviation. Policy options to reduce emissions further include more stringent aircraft engine emissions regulations, removal of subsidies and incentives that have negative environmental consequences, market-based options such as environmental levies (charges and taxes) and emissions trading, voluntary agreements, research programmes, and substitution of aviation by rail and coach. Most of these options would lead to increased airline costs and fares. Some of these approaches have not been fully investigated or tested in aviation and their outcomes are uncertain.

Engine emissions certification is a means for reducing specific emissions. The aviation authorities currently use this approach to regulate emissions for carbon monoxide, hydrocarbons, NO_x, and smoke. The International Civil Aviation Organization has begun work to assess the need for standards for aircraft emissions at cruise altitude to complement existing LTO standards for NO_x and other emissions.

Market-based options, such as environmental levies (charges and taxes) and emissions trading, have the potential to encourage technological innovation and to improve efficiency, and may reduce demand for air travel. Many of these approaches have not been fully investigated or tested in aviation and their outcomes are uncertain.

Environmental levies (charges and taxes) could be a means for reducing growth of aircraft emissions by further stimulating the development and use of more efficient aircraft and by reducing growth in demand for aviation transportation. Studies show that to be environmentally effective, levies would need to be addressed in an international framework.

Another approach that could be considered for mitigating aviation emissions is emissions trading, a market-based approach which enables participants to cooperatively minimize the costs of reducing emissions. Emissions trading has not been tested in aviation though it has been used for sulfur dioxide (SO₂) in the United States of America and is possible for ozone-depleting substances in the Montreal Protocol. This approach is one of the provisions of the Kyoto Protocol where it applies to Annex B Parties.

Voluntary agreements are also currently being explored as a means of achieving reductions in emissions from the aviation

sector. Such agreements have been used in other sectors to reduce greenhouse gas emissions or to enhance sinks.

Measures that can also be considered are removal of subsidies or incentives which would have negative environmental consequences, and research programmes.

Substitution by rail and coach could result in the reduction of carbon dioxide emissions per passenger-km. The scope for this reduction is limited to high density, short-haul routes, which could have coach or rail links. Estimates show that up to 10% of the travelers in Europe could be transferred from aircraft to high-speed trains. Further analysis, including trade-offs between a wide range of environmental effects (e.g., noise exposure, local air quality, and global atmospheric effects) is needed to explore the potential of substitution.

7. Issues for the Future

This report has assessed the potential climate and ozone changes due to aircraft to the year 2050 under different scenarios. It recognizes that the effects of some types of aircraft emissions are well understood. It also reveals that the effects of others are not, because of the many scientific uncertainties. There has been a steady improvement in characterizing the potential impacts of human activities, including the effects of aviation on the global atmosphere. The report has also examined technological advances, infrastructure improvements, and regulatory or market-based measures to reduce aviation emissions. Further work is required to reduce scientific and other uncertainties, to understand better the options for reducing emissions, to better inform decisionmakers, and to improve the understanding of the social and economic issues associated with the demand for air transport.

There are a number of key areas of scientific uncertainty that limit our ability to project aviation impacts on climate and ozone:

- The influence of contrails and aerosols on cirrus clouds
- The role of NO_x in changing ozone and methane concentrations
- The ability of aerosols to alter chemical processes
- The transport of atmospheric gases and particles in the upper troposphere/lower stratosphere
- The climate response to regional forcings and stratospheric perturbations.

There are a number of key socio-economic and technological issues that need greater definition, including *inter alia* the following:

- Characterization of demand for commercial aviation services, including airport and airway infrastructure constraints and associated technological change
- Methods to assess external costs and the environmental benefits of regulatory and market-based options
- Assessment of the macroeconomic effects of emission reductions in the aviation industry that might result from mitigation measures
- Technological capabilities and operational practices to reduce emissions leading to the formation of contrails and increased cloudiness
- The understanding of the economic and environmental effects of meeting potential stabilization scenarios (for atmospheric concentrations of greenhouse gases), including measures to reduce emissions from aviation and also including such issues as the relative environmental impacts of different transportation modes.

LIST OF IPCC OUTPUTS

I. IPCC FIRST ASSESSMENT REPORT, 1990

- a) **CLIMATE CHANGE — The IPCC Scientific Assessment.** The 1990 report of the IPCC Scientific Assessment Working Group (*also in Chinese, French, Russian and Spanish*).
- b) **CLIMATE CHANGE — The IPCC Impacts Assessment.** The 1990 report of the IPCC Impacts Assessment Working Group (*also in Chinese, French, Russian and Spanish*).
- c) **CLIMATE CHANGE — The IPCC Response Strategies.** The 1990 report of the IPCC Response Strategies Working Group (*also in Chinese, French, Russian and Spanish*).
- d) **Overview and Policymaker Summaries, 1990.**

Emissions Scenarios (prepared by the IPCC Response Strategies Working Group), 1990.

Assessment of the Vulnerability of Coastal Areas to Sea Level Rise — A Common Methodology, 1991.

II. IPCC SUPPLEMENT, 1992

- a) **CLIMATE CHANGE 1992 — The Supplementary Report to the IPCC Scientific Assessment.** The 1992 report of the IPCC Scientific Assessment Working Group.
- b) **CLIMATE CHANGE 1992 — The Supplementary Report to the IPCC Impacts Assessment.** The 1992 report of the IPCC Impacts Assessment Working Group.

CLIMATE CHANGE: The IPCC 1990 and 1992 Assessments — IPCC First Assessment Report Overview and Policymaker Summaries, and 1992 IPCC Supplement (*also in Chinese, French, Russian and Spanish*).

Global Climate Change and the Rising Challenge of the Sea. Coastal Zone Management Subgroup of the IPCC Response Strategies Working Group, 1992.

Report of the IPCC Country Study Workshop, 1992.

Preliminary Guidelines for Assessing Impacts of Climate Change, 1992.

III. IPCC SPECIAL REPORT, 1994

CLIMATE CHANGE 1994 — Radiative Forcing of Climate Change and An Evaluation of the IPCC IS92 Emission Scenarios.

IV. IPCC SECOND ASSESSMENT REPORT, 1995

- a) **CLIMATE CHANGE 1995 — The Science of Climate Change** (including Summary for Policymakers). Report of IPCC Working Group I, 1995.
- b) **CLIMATE CHANGE 1995 — Scientific-Technical Analyses of Impacts, Adaptations and Mitigation of Climate Change** (including Summary for Policymakers). Report of IPCC Working Group II, 1995.

- c) **CLIMATE CHANGE 1995 — The Economic and Social Dimensions of Climate Change** (including Summary for Policymakers). Report of IPCC Working Group III, 1995.
- d) **The IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change**, 1995.

(Please note: the IPCC Synthesis and the three Summaries for Policymakers have been published in a single volume and are also available in Arabic, Chinese, French, Russian and Spanish.)

V. IPCC METHODOLOGIES

- a) **IPCC Guidelines for National Greenhouse Gas Inventories** (3 volumes), 1994 (*also in French, Russian and Spanish*).
- b) **IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations**, 1995 (*also in Arabic, Chinese, French, Russian and Spanish*).
- c) **Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories** (3 volumes), 1996.

VI. IPCC TECHNICAL PAPERS

TECHNOLOGIES, POLICIES AND MEASURES FOR MITIGATING CLIMATE CHANGE — IPCC Technical Paper 1, 1996 (*also in French and Spanish*).

AN INTRODUCTION TO SIMPLE CLIMATE MODELS USED IN THE IPCC SECOND ASSESSMENT REPORT — IPCC Technical Paper 2, 1997 (*also in French and Spanish*).

STABILIZATION OF ATMOSPHERIC GREENHOUSE GASES: PHYSICAL, BIOLOGICAL AND SOCIO-ECONOMIC IMPLICATIONS — IPCC Technical Paper 3, 1997 (*also in French and Spanish*).

IMPLICATIONS OF PROPOSED CO₂ EMISSIONS LIMITATIONS — IPCC Technical Paper 4, 1997 (*also in French and Spanish*).

VII. IPCC SPECIAL REPORT, 1997

THE REGIONAL IMPACTS OF CLIMATE CHANGE: AN ASSESSMENT OF VULNERABILITY (including Summary for Policymakers, which is available in *Arabic, Chinese, English, French, Russian and Spanish*).

A Special Report of IPCC Working Group II, 1997.

VIII. IPCC SPECIAL REPORT, 1999

AVIATION AND THE GLOBAL ATMOSPHERE (including Summary for Policymakers, which is available in *Arabic, Chinese, English, French, Russian and Spanish*).

A Special Report of IPCC Working Groups I and II, 1999.

AL-14-001-4/92

MARK R. WARNER
VIRGINIA

United States Senate

WASHINGTON, DC 20510-4606

August 15, 2014

COMMITTEES:
FINANCE

BANKING, HOUSING, AND
URBAN AFFAIRS

BUDGET

INTELLIGENCE

RULES AND ADMINISTRATION

Ms. Joyce K. Frank
Office of Congressional and Intergovernmental Relations
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Room 3426 ARN
Washington, DC 20460

Dear Ms. Frank,

I have recently been contacted by several of my constituents (61) concerned about EPA policies. Attached, please find a few copies of their correspondence. I would appreciate it if you could look into this matter and provide me with an appropriate response. Thank you.

Sincerely,



MARK R. WARNER
United States Senator

MRW/lm
Enclosures

Exempt 6

Exempt 6

Exempt 6

Date: 7/21/2014

I, the Undersigned, oppose giving the EPA the power to seize property and garnish wages to satisfy its fines and punishments without going through the courts.

Exempt b

Exempt b
Exempt b
Exempt b

Date: 7/28/2014

I oppose giving the EPA the power to seize property and garnish wages to satisfy its fines and punishments without going through the courts. The EPA is not an elected body and should not have the power it currently wields. It should merely make recommendations to Congress for environmental laws and enforcement policies/fines which must then be approved and passed by elected representatives. Then the EPA could enforce those laws. That would bring accountability into the fray, which is currently lacking.

Exempt 6

Exempt 6
Exempt 6
Exempt 6

Date: 7/21/2014

WE, the Undersigned, oppose giving the EPA the power to seize property and garnish wages to satisfy its fines and punishments without going through the courts. I am strongly against this power grab by the EPA, which is seemingly becoming more fascist, and less democratic, with each passing week. I urge you to act to deny the EPA this capability.

Full Batch -- 64 Record(s)

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30	07/21/2014	E-Mail	Lauren Marshall	Completed		23228	FORMAL	E-Mail	BUCK to Constituent v.1 (12/4/2013) Q
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
Response: BUCK to Constituent v.1 (12/4/2013) Q (Edit Library)									
31	07/21/2014	E-Mail	Hold	Hold	Approved	20194	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
32	07/28/2014	E-Mail	Hold	Hold	Approved	22187	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner									
33	07/21/2014	E-Mail	Hold	Hold	Approved	23294	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
34	07/21/2014	E-Mail	Hold	Hold	Approved	20185	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
35	08/13/2014	US Mail	Lauren Marshall	Approved		24382	FORMAL	US Mail	08/13/2014 12:42 PM
36	07/21/2014	E-Mail	Hold	Hold	Approved	20147	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL									

E-Mail Subj: Contact Senator Warner										
37	Exempt	3/11/2014	E-Mail	Lauren Marshall	Approved	Exempt	20147	FORMAL Mrs.	E-Mail	08/15/2014 12:31 PM
F-Mail Subj: Contact Senator Warner										
38	Exempt	8/7/21/2014	E-Mail	Hold Hold	Approved	Exempt	24228	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
39	Exempt	07/21/2014	E-Mail	Hold Hold	Approved	Exempt	20191	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
40	Exempt	8/7/21/2014	E-Mail	Hold Hold	Approved	Exempt	23455	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
41	Exempt	07/28/2014	E-Mail	Hold Hold	Approved	Exempt	23462	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner										
42	Exempt	8/21/2014	E-Mail	Hold Hold	Approved	Exempt	24137	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
43	Exempt	07/21/2014	E-Mail	Hold Hold	Approved	Exempt	22025	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
44	Exempt	07/21/2014	E-Mail	Hold Hold	Approved	Exempt	20147	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
45	Exempt	07/21/2014	E-Mail	Hold Hold	Approved	Exempt	20132	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
46	Exempt	8/7/21/2014	E-Mail	Hold Hold	Approved	Exempt	24101	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
47	Exempt	8/21/2014	E-Mail	Hold Hold	Approved	Exempt	22602	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
48	Exempt	08/13/2014	US Mail	Lauren Marshall	Approved	Exempt	22485	US Mail		08/13/2014 12:41 PM
49	Exempt	8/21/2014	E-Mail	Hold Hold	Approved	Exempt	24018	FORMAL	E-Mail	08/15/2014

		Mail				exempt b	Mr. Sublett		12:31 PM	
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
5	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	24523	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
51	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	2318	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
52	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	2018	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
53	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	228	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
54	07/28/2014	E-Mail	Hold	Hold	Approved	exempt b	2435	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner										
5	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	22508	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
5	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	23117	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
5	07/28/2014	E-Mail	Hold	Hold	Approved	exempt b	22407	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner										
5	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	24723	FORMAL	E-Mail	08/15/2014 12:31 PM
Comments: GENERAL										
E-Mail Subj: Contact Senator Warner										
59	07/28/2014	E-Mail	Hold	Hold	Approved	exempt b	24121	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner										
60	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	22931	FORMAL	E-Mail	07/31/2014 05:50 PM
E-Mail Subj: Contact Senator Warner										
61	07/21/2014	E-Mail	Hold	Hold	Approved	exempt b	24582	FORMAL	E-Mail	08/15/2014 12:31 PM

<i>Exempt 6</i>									
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
<i>Exempt 6</i>	7/21/2014	E-Mail	Hold	Hold	Approved	20187	FORMAL	E-Mail	08/15/2014 12:31 PM
<i>Exempt 6</i>									
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									
<i>Exempt 6</i>	7/28/2014	E-Mail	Hold	Hold	Approved	2417		E-Mail	07/31/2014 05:50 PM
<i>Exempt 6</i>									
F-Mail Subj: Contact Senator Warner									
<i>Exempt 6</i>	07/21/2014	E-Mail	Hold	Hold	Approved	2218	FORMAL	E-Mail	08/15/2014 12:31 PM
<i>Exempt 6</i>									
Comments: GENERAL									
E-Mail Subj: Contact Senator Warner									



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT - 8 2014

OFFICE OF THE
CHIEF FINANCIAL OFFICER

The Honorable Mark R. Warner
United States Senate
Washington, DC 20510

Dear Senator Warner:

Thank you for your letter of July 17, 2014, to the U.S. Environmental Protection Agency's Office of Congressional and Intergovernmental Relations. I appreciate this opportunity to clarify for your constituents the EPA's direct final rule, "Administrative Wage Garnishment," which the EPA published in the Federal Register on July 2, 2014, at 79 FR 37644. This Federal Register notice advised the public that the direct final rule would be withdrawn if the EPA received adverse comments. The EPA withdrew the direct final rule on July 17, 2014, at 79 FR 41646, after receiving adverse comments. The EPA's proposed rule to use administrative wage garnishment as a debt collection tool however, remained open. On July 23, 2014, the EPA extended the comment period, which closed on September 2, 2014, to provide additional time for public comment to the agency.

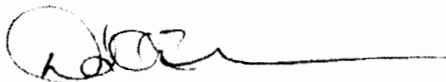
The Debt Collection Improvement Act of 1996 (Public Law 104-134) gives federal agencies the authority to collect delinquent non-tax debt owed by individuals to the United States through administrative wage garnishment without first obtaining a court order after debtors have been afforded appropriate due process rights, such as the right to request an administrative pre-wage garnishment hearing. Currently, at least 30 federal agencies use such wage garnishment to collect non-tax delinquent federal debt. We are unaware of any successful constitutional due process challenges to the Debt Collection Improvement Act of 1996. In addition, administrative wage garnishment is a collection tool authorized by Congress and the proposed rule does not give the EPA new authorization or put into place new authorities.

The EPA will begin using administrative wage garnishment after the proposed rule becomes final and following negotiations with the Department of Treasury on a memorandum of understanding, as the EPA has chosen for the Department of Treasury to conduct any administrative wage garnishment hearings on the EPA's behalf. When the EPA begins using administrative wage garnishment, the Department of Treasury will send a wage garnishment notice to the debtor. A debtor may request a hearing from the Department of Treasury concerning the existence or amount of the debt, or the terms of the proposed repayment schedule under the administrative wage garnishment order.

Administrative wage garnishment is only one of a suite of debt collection tools used by federal agencies to collect delinquent non-tax debt. Our proposed rule will make available this tool to the EPA, so the EPA can join with other federal agencies in ensuring that non-tax delinquent debts are recovered for appropriate public use.

Again, thank you for your letter. If you have further questions, please contact me or your staff may contact Christina Moody in the EPA's Office of Congressional and Intergovernmental Relations at (202) 564-0260.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. Bloom', followed by a long horizontal line extending to the right.

David A. Bloom
Acting Chief Financial Officer

AL-14-001-5267

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DEANNE SALVAGE
STAFF DIRECTOR

Congress of the United States
U.S. House of Representatives
COMMITTEE ON WAYS AND MEANS

1102 LONGWORTH HOUSE OFFICE BUILDING
(202) 225-3625

Washington, DC 20515-0348

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JANICE MAYES
MINORITY CHIEF COUNSEL

September 16, 2014

The Honorable Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator McCarthy,

As you know, the Committee on Ways and Means of the U.S. House of Representatives is conducting an investigation of the targeting by the Internal Revenue Service (IRS) of taxpayers on the basis of their political views. On June 26, 2014, we wrote to you to request all communications between any persons within the Environmental Protection Agency and several IRS employees for the period between January 1, 2009 and May 14, 2013. Today, we write to request the same for the following IRS employees:

Exempt 6
Exempt 6

Thank you in advance for your assistance in this matter. If you have any questions, please contact Committee staff at 202-225-5522.

Sincerely,

Dave Camp
DAVE CAMP
Chairman

C.W. Boustany
CHARLES W. BOUSTANY, Jr. MD
Chairman
Subcommittee on Oversight

AL-14001-5770

United States Senate

WASHINGTON, DC 20510

September 19, 2014

Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Administrator McCarthy:

We are writing to request that the Environmental Protection Agency (EPA) continue to work towards developing a reliable and commercially available test kit that meets the requirements described in the "Lead: Renovation, Repair and Painting Rule" (RRP) section 40 C.F.R. § 745.88.

As you know, the regulation required EPA to have a commercially available lead testing kit that has a false negative rate of less than 5 percent and a false positive rate of less than 10 percent by September 1, 2010. To date, EPA has failed to approve a test kit that meets these statutory requirements and, consequently, contractors are forced to use inaccurate test kits; send paint chips to a lab at significant expense and wait for weeks for results; or, use prescribed work practices without knowing if a hazard exists. EPA's own performance verification data indicate that the two test kits recognized by EPA have false positive rates between 22.5 percent and 84 percent depending on the test kit used, the substrate tested, color of paint and operator experience.

This is particularly concerning for homes built between 1960 and 1978. An accurate test kit would be especially helpful for contractors working in these homes, as EPA estimates that only 24 percent of this housing stock contains lead paint. Homeowners in the 76 percent of homes from this time period where no lead is present should not be subjected to work practices that are not needed and provide no benefit.

The existing rule is very different from the one finalized in April 2008, which was subjected to EPA's economic analysis and approved by the Office of Management and Budget. EPA's entire economic analysis for the RRP rule, and its impact on small businesses, hinges on the availability of an affordable, reliable, and accurate test kit as originally envisioned. The absence of a compliant test kit throws the analysis very much into question.

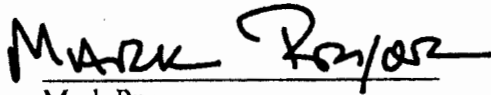
We are troubled that EPA has discontinued its efforts to produce a lead testing kit that meets the RRP performance criteria. We believe it is unacceptable for EPA to abandon the development of a compliant test kit while still requiring contractors to demonstrate by test that these older homes are lead free. The lack of a compliant test kit forces the full application of the RRP Rule on homes that otherwise would have tested negative.

EPA should continue working to meet this requirement and we ask that it make the development and recognition of a compliant test kit a priority. If the Agency is unwilling to take this commonsense step, at a minimum, we ask that it revise the economic analysis so that the true cost of this regulation can finally be known.

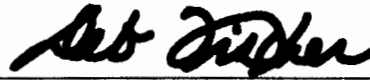
We appreciate your prompt attention to this matter, and we ask that you respond to us detailing all actions that you are taking to develop a reliable and accurate lead test kit that ensures safety while minimizing the need for unnecessary work practices.

Thank you for your consideration of this important matter.

Sincerely,



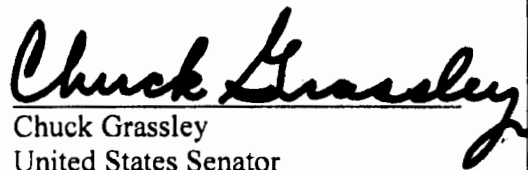
Mark Pryor
United States Senator



Deb Fischer
United States Senator



Joe Donnelly
United States Senator



Chuck Grassley
United States Senator



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 23 2014

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

The Honorable Mark Pryor
United States Senate
Washington, DC 20510

Dear Senator Pryor:

Thank you for your letter of September 19, 2014 to the U.S. Environmental Protection Agency regarding the reliability and commercial availability of a test kit that meets the requirements described in "Lead; Renovation, Repair, and Painting Program" (73 FR 21692, April 22, 2008) and 40 CFR 745.88.

The EPA put forth significant effort and resources to foster the development of a test kit that would meet both the false negative and false positive criteria outlined in the 2008 RRP rule. As stated in the preamble to that rule, the EPA determined that the EPA's Environmental Technology Verification Program was a suitable vehicle for obtaining independent laboratory validation of test kit performance and that the EPA intended to use ETV or an equivalent testing program to evaluate test kits. The EPA further stated that any recognition granted to test kits based only on the false negative criterion will expire when the EPA publicizes its recognition of the first improved test kit that meets both the false negative and false positive criteria of 40 CFR 745.88(c). Despite the EPA's commitment of resources to this effort, to date no company's test kit has met both of the performance criteria outlined in the RRP rule.

On September 1, 2008, the ETV program began accepting applications for testing from test kit manufacturers. For more than two years, the EPA supported test kit research and development efforts by several private companies by funding not only the manufacture of testing reference materials, but also the technical evaluation of test kits through the ETV program. After a test kit has gone through the ETV or other EPA-approved testing process, the EPA reviews the test report to determine whether the kit has demonstrated it can achieve the criteria set forth in the rule. In addition to the two test kits that were recognized by the EPA in 2008, the EPA recognized an additional test kit in 2010 as a result of these efforts. In 2012, the EPA expanded its recognition for an existing test kit to include its use on two additional substrates. Test data were provided by the manufacturer of the test kit and generated by an independent third-party laboratory using an EPA-approved test protocol. Please note, the ETV program concluded operations in early 2014.

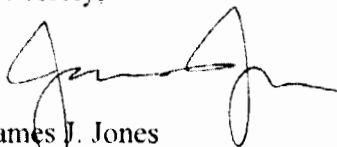
At this time, the agency is aware of a lead test kit research grant recently awarded by the U.S. Department of Housing and Urban Development's Office of Lead Hazard Control and Healthy Homes under its Lead Technical Studies grant program. The grantee has yet to initiate research, but the EPA will monitor progress and, once available, the agency will review results of this research and assess its impact on the capabilities of existing lead test kit technology. Although the EPA is unaware of any other test kit currently available or under development that would also meet the positive criterion, any commercial entity that wishes to receive the EPA recognition of their test kit may have an

ETV-equivalent evaluation performed and present evaluation results to the EPA for consideration and potential recognition. As mentioned, to date one company has done this, which resulted in expanded EPA recognition in 2012. Additionally, recent Congressional report language directs the agency to prioritize efforts with stakeholders in fiscal year 2015 to identify solutions that would allow for a test kit to meet the criteria within the 2008 rule to reduce costs for consumers, remodelers and families to comply with the rule and, if no solution is reached by the end of the fiscal year, to revisit the test kit criteria in the 2008 rule and solicit public comment on alternatives. The EPA will be moving forward in fiscal year 2015 to carry out this Congressional direction.

In regard to concerns raised about economic analysis for the RRP rule, however, the agency conducted an extensive economic analysis while developing the rule, which indicated that the requirements of the rule are not excessive or overly burdensome in light of the importance of avoiding the potentially severe consequences of exposure to lead-based paint hazards. The agency does not believe it is cost effective to revise the economic analysis for the RRP rule because, even if the cost estimates were understated, the benefits estimate would still significantly outweigh the costs. At this time, therefore, the EPA does not believe that revising the 2006 economic analysis that supported a 2008 final rule is an appropriate course of action. However, the agency is mindful of the concerns related to test kits and is considering the lack of availability of a commercially available lead testing kit that would meet both the false negative and false positive criteria outlined in the RRP rule, among other factors, as it revises and renews the Information Collection Request for ongoing implementation of the RRP rule.

Again, thank you for your letter. If you have further questions, please contact me or Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or 202-566-2753.

Sincerely,

A handwritten signature in black ink, appearing to read 'James J. Jones', with a stylized, flowing script.

James J. Jones
Assistant Administrator



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 23 2014

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

The Honorable Deb Fischer
United States Senate
Washington, DC 20510

Dear Senator Fischer:

Thank you for your letter of September 19, 2014 to the U.S. Environmental Protection Agency regarding the reliability and commercial availability of a test kit that meets the requirements described in "Lead; Renovation, Repair, and Painting Program" (73 FR 21692, April 22, 2008) and 40 CFR 745.88.

The EPA put forth significant effort and resources to foster the development of a test kit that would meet both the false negative and false positive criteria outlined in the 2008 RRP rule. As stated in the preamble to that rule, the EPA determined that the EPA's Environmental Technology Verification Program was a suitable vehicle for obtaining independent laboratory validation of test kit performance and that the EPA intended to use ETV or an equivalent testing program to evaluate test kits. The EPA further stated that any recognition granted to test kits based only on the false negative criterion will expire when the EPA publicizes its recognition of the first improved test kit that meets both the false negative and false positive criteria of 40 CFR 745.88(c). Despite the EPA's commitment of resources to this effort, to date no company's test kit has met both of the performance criteria outlined in the RRP rule.

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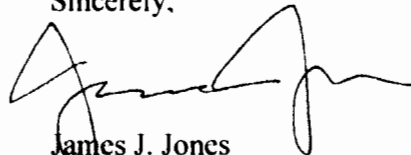
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ETV-equivalent evaluation performed and present evaluation results to the EPA for consideration and potential recognition. As mentioned, to date one company has done this, which resulted in expanded EPA recognition in 2012. Additionally, recent Congressional report language directs the agency to prioritize efforts with stakeholders in fiscal year 2015 to identify solutions that would allow for a test kit to meet the criteria within the 2008 rule to reduce costs for consumers, remodelers and families to comply with the rule and, if no solution is reached by the end of the fiscal year, to revisit the test kit criteria in the 2008 rule and solicit public comment on alternatives. The EPA will be moving forward in fiscal year 2015 to carry out this Congressional direction.

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Again, thank you for your letter. If you have further questions, please contact me or Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or 202-566-2753.

Sincerely,

A handwritten signature in black ink, appearing to read 'James J. Jones', with a stylized, flowing script.

James J. Jones
Assistant Administrator



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 23 2014

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

The Honorable Joe Donnelly
United States Senate
Washington, DC 20510

Dear Senator Donnelly:

Thank you for your letter of September 19, 2014 to the U.S. Environmental Protection Agency regarding the reliability and commercial availability of a test kit that meets the requirements described in "Lead: Renovation, Repair, and Painting Program" (73 FR 21692, April 22, 2008) and 40 CFR 745.88.

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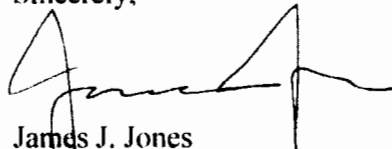
At this time, the agency is aware of a lead test kit research grant recently awarded by the U.S. Department of Housing and Urban Development's Office of Lead Hazard Control and Healthy Homes under its Lead Technical Studies grant program. The grantee has yet to initiate research, but the EPA will monitor progress and, once available, the agency will review results of this research and assess its impact on the capabilities of existing lead test kit technology. Although the EPA is unaware of any other test kit currently available or under development that would also meet the positive criterion, any commercial entity that wishes to receive the EPA recognition of their test kit may have an

ETV-equivalent evaluation performed and present evaluation results to the EPA for consideration and potential recognition. As mentioned, to date one company has done this, which resulted in expanded EPA recognition in 2012. Additionally, recent Congressional report language directs the agency to prioritize efforts with stakeholders in fiscal year 2015 to identify solutions that would allow for a test kit to meet the criteria within the 2008 rule to reduce costs for consumers, remodelers and families to comply with the rule and, if no solution is reached by the end of the fiscal year, to revisit the test kit criteria in the 2008 rule and solicit public comment on alternatives. The EPA will be moving forward in fiscal year 2015 to carry out this Congressional direction.

In regard to concerns raised about economic analysis for the RRP rule, however, the agency conducted an extensive economic analysis while developing the rule, which indicated that the requirements of the rule are not excessive or overly burdensome in light of the importance of avoiding the potentially severe consequences of exposure to lead-based paint hazards. The agency does not believe it is cost effective to revise the economic analysis for the RRP rule because, even if the cost estimates were understated, the benefits estimate would still significantly outweigh the costs. At this time, therefore, the EPA does not believe that revising the 2006 economic analysis that supported a 2008 final rule is an appropriate course of action. However, the agency is mindful of the concerns related to test kits and is considering the lack of availability of a commercially available lead testing kit that would meet both the false negative and false positive criteria outlined in the RRP rule, among other factors, as it revises and renews the Information Collection Request for ongoing implementation of the RRP rule.

Again, thank you for your letter. If you have further questions, please contact me or Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or 202-566-2753.

Sincerely,

A handwritten signature in black ink, appearing to read 'James J. Jones', with a stylized, flowing script.

James J. Jones
Assistant Administrator



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 23 2014

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

The Honorable Chuck Grassley
United States Senate
Washington, DC 20510

Dear Senator Grassley:

Thank you for your letter of September 19, 2014 to the U.S. Environmental Protection Agency regarding the reliability and commercial availability of a test kit that meets the requirements described in "Lead: Renovation, Repair, and Painting Program" (73 FR 21692, April 22, 2008) and 40 CFR 745.88.

The EPA put forth significant effort and resources to foster the development of a test kit that would meet both the false negative and false positive criteria outlined in the 2008 RRP rule. As stated in the preamble to that rule, the EPA determined that the EPA's Environmental Technology Verification Program was a suitable vehicle for obtaining independent laboratory validation of test kit performance and that the EPA intended to use ETV or an equivalent testing program to evaluate test kits. The EPA further stated that any recognition granted to test kits based only on the false negative criterion will expire when the EPA publicizes its recognition of the first improved test kit that meets both the false negative and false positive criteria of 40 CFR 745.88(c). Despite the EPA's commitment of resources to this effort, to date no company's test kit has met both of the performance criteria outlined in the RRP rule.

On September 1, 2008, the ETV program began accepting applications for testing from test kit manufacturers. For more than two years, the EPA supported test kit research and development efforts by several private companies by funding not only the manufacture of testing reference materials, but also the technical evaluation of test kits through the ETV program. After a test kit has gone through the ETV or other EPA-approved testing process, the EPA reviews the test report to determine whether the kit has demonstrated it can achieve the criteria set forth in the rule. In addition to the two test kits that were recognized by the EPA in 2008, the EPA recognized an additional test kit in 2010 as a result of these efforts. In 2012, the EPA expanded its recognition for an existing test kit to include its use on two additional substrates. Test data were provided by the manufacturer of the test kit and generated by an independent third-party laboratory using an EPA-approved test protocol. Please note, the ETV program concluded operations in early 2014.

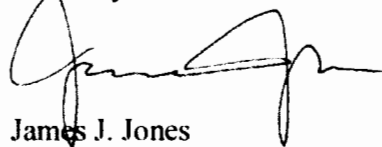
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Again, thank you for your letter. If you have further questions, please contact me or Sven-Erik Kaiser in the EPA's Office of Congressional and Intergovernmental Relations at kaiser.sven-erik@epa.gov or 202-566-2753.

Sincerely,

A handwritten signature in black ink, appearing to read 'James J. Jones', with a stylized flourish at the end.

James J. Jones
Assistant Administrator

Sep/28/2014 12:35:42 PM

AL-15-000-0029
SEN JOE MANCHIN 13042823039

2/4

JOE MANCHIN III
WEST VIRGINIA

SUITE 208
HART BUILDING
WASHINGTON, DC 20510
(202) 224-3884

United States Senate

WASHINGTON, DC 20510-4804

ENERGY AND NATURAL
RESOURCES COMMITTEE
ARMED SERVICES COMMITTEE
SPECIAL COMMITTEE ON AGING
BANKING, HOUSING, AND
URBAN AFFAIRS COMMITTEE

September 23, 2014

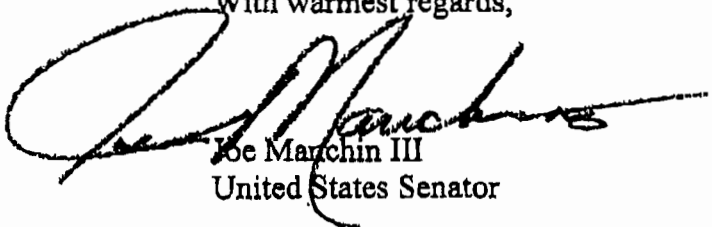
Ms. Laura Vaught
Associate Administrator for Congressional
and Intergovernmental Relations
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W., Room 3426 ARN
Washington, D.C. 20460-0003

Dear Ms. Vaught,

Please see the attached correspondence from my constituent, *exempt*
exempt, who is requesting assistance
with his request to waive the fine imposed due to financial hardship.

I would appreciate your looking into the matter, and providing me with comments
in writing that may serve as the basis for a reply to my constituent. Thank you for
your attention, and I look forward to receiving your response in my Martinsburg
office at 303 Hart Senate Office Building, Washington DC 20510.

With warmest regards,



Joe Manchin III
United States Senator

JM/aw

Enclosures



Scherrer Engineering

3042429817

p.1

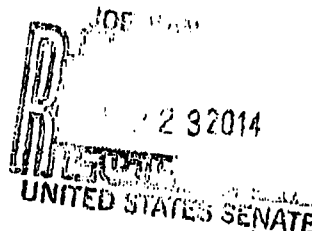
United States Senate

WASHINGTON, DC 20510-4801

AUTHORIZATION FORM

Please complete and return this form to:

Office of U.S. Senator Joe Manchin III
900 Pennsylvania Avenue, Suite 629
Charleston, West Virginia 25302
Phone: 304-342-5855 Fax: (304) 343-7144



In order to protect your privacy, the Privacy Act of 1974 requires that I receive written permission from you so that I may make an inquiry with the appropriate officials on your behalf. If you are in need of assistance, please complete this authorization form and return it immediately. As soon as I receive this form, I will be pleased to do everything I can to provide assistance to you.

Joe Manchin III
United States Senate

9-23-2014

(Date)

This will authorize the release to Senator Joe Manchin III of any pertinent information concerning my claim currently pending with the US EPA

(Agency)

Exempt 6
(Signature)

Exempt 6
(Print Name in Full)

Exempt 6
(Street Address)

Exempt 6
(Telephone Number)

Exempt 6
(City, State, Zip Code)

Exempt 6
(Social Security Number)

Please provide a brief explanation of the problem below:

PLEASE SEE THE ATTACHMENT TO THIS FAX.

E-Mail Viewer

Message	Details	Attachments	Headers	Source
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[HTML](#)

From: "no-reply@manchin.senate.gov" <no-reply@manchin.senate.gov>
Date: 9/22/2014 7:20:45 PM
To: "webmail@manchin-ic.senate.gov" <webmail@manchin-ic.senate.gov>
Cc:
Subject: EPA fine for my construction business

Dear Sen. Manchin:

I need your help in resolving an issue involving a fine that the US EPA wants to impose on my business, Scherrer Engineering & Construction, because of a lead paint issue. I was not aware of the need to be certified to do work on buildings that have lead paint. The condo where I was working, was vacant at the time, when the work was being done. We were changing all of the windows and replacing the wood casing, which had been painted with a paint containing lead. Since being sited by EPA, I have become certified and bought the recommended tools and educated my employees about this matter. There are a lot more details that I can supply, but I am facing a fine of \$22,500, which is an extreme hardship for my small business. Thank you in advance for any help that you can give me.

Kenya

Close

OFFICE OF U.S. SENATOR JOE MANCHIN III

261 AIKENS CENTER, SUITE 305

MARTINSBURG, WV 25404

PHONE: 304.264.4626 FAX: 304.262.3039



FACSIMILE TRANSMITTAL SHEET

TO:

Associate Administrator for
Congressional
and Intergovernmental Relations
Environmental Protection Agency

FROM:

Angie Walsh
Office of Senator Joe Manchin

COMPANY:

DATE:

9/23/14

FAX NUMBER:

202-501-1519

TOTAL NO. OF PAGES, INCLUDING COVER:

4

PHONE NUMBER:

SENDER'S REFERENCE NUMBER:

RE:

YOUR REFERENCE NUMBER:

Exempt☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☒ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Please see the attached correspondence from *Exempt* regarding his request to waive imposed fines due to financial hardship. Any information you may provide would be greatly appreciated.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

OCT 22 2014

The Honorable Joe Manchin III
United States Senator
261 Aikens Center, Suite 305
Martinsburg, West Virginia 25404

Dear Senator Manchin:

Thank you for your September 23, 2014 letter to the U.S. Environmental Protection Agency (EPA) on behalf of your constituent, *Exempt* *Exempt* expressed concerns about fines and potential hardship resulting from EPA's pending enforcement action against his company, Scherrer Engineering and Construction, for alleged noncompliance with certain provisions of the Renovation, Repair, and Painting Rule.

EPA enforces all applicable statutes to protect human health and the environment. The goals of EPA's lead-based paint enforcement program is to prevent lead poisoning, especially in children under six years of age, to raise awareness of the hazards posed by lead-based paint and to level the playing field for those that follow the law. EPA's enforcement of the law ensures that companies and individuals who violate the regulations are held accountable.

With regard to *Exempt* request, EPA has an established process to address hardship claims. The alleged violator must, during settlement negotiations, raise an inability to pay claim and then provide financial documentation to EPA to substantiate that claim. In determining penalties, EPA takes into account a number of factors, including a violator's ability to pay and their ability to continue to do business.

If you have any questions, please do not hesitate to contact me or have your staff contact Mr. Mark Ferrell, EPA's West Virginia Liaison, at 304-542-0231.

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn M. Garvin", is written over a horizontal line.

Shawn M. Garvin
Regional Administrator



AL-15-000-0079

MARK R. WARNER
VIRGINIA

United States Senate

WASHINGTON, DC 20510-4606

September 19, 2014

COMMITTEES:
FINANCE

BANKING, HOUSING, AND
URBAN AFFAIRS

BUDGET

INTELLIGENCE

RULES AND ADMINISTRATION

Ms. Joyce K. Frank
Office of Congressional and Intergovernmental Relations
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Room 3426 ARN
Washington, DC 20460

Dear Ms. Frank,

I have recently been contacted by *Exempt 6* s of Port Republic, Virginia. Attached please find a copy of that correspondence. I would appreciate it if you could look into this matter and provide me with an appropriate response. Thank you.

Sincerely,



MARK R. WARNER
United States Senator

MRW/lm
Enclosure

exempt b

exempt b

exempt b

exempt b

Date: 9/2/2014

WE, the Undersigned, oppose giving the EPA the power to seize property and garnish wages to satisfy its fines and punishments without going through the courts.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 28 2014

OFFICE OF THE
CHIEF FINANCIAL OFFICER

The Honorable Mark R. Warner
United States Senate
Washington, DC 20510

Dear Senator Warner:

Thank you for your letter of September 19, 2014, to the U.S. Environmental Protection Agency's Office of Congressional and Intergovernmental Relations. I appreciate this opportunity to clarify for your constituent the EPA's direct final rule, "Administrative Wage Garnishment," which the EPA published in the Federal Register on July 2, 2014, at 79 FR 37644. This Federal Register notice advised the public that the direct final rule would be withdrawn if the EPA received adverse comments. The EPA withdrew the direct final rule on July 17, 2014, at 79 FR 41646, after receiving adverse comments. The EPA's proposed rule to use administrative wage garnishment as a debt collection tool however, remained open. On July 23, 2014, the EPA extended the comment period, which closed on September 2, 2014, to provide additional time for public comment to the agency.

The Debt Collection Improvement Act of 1996 (Public Law 104-134) gives federal agencies the authority to collect delinquent non-tax debt owed by individuals to the United States through administrative wage garnishment without first obtaining a court order after debtors have been afforded appropriate due process rights, such as the right to request an administrative pre-wage garnishment hearing. Currently, at least 30 federal agencies use such wage garnishment to collect non-tax delinquent federal debt. We are unaware of any successful constitutional due process challenges to the Debt Collection Improvement Act of 1996. In addition, administrative wage garnishment is a collection tool authorized by Congress and the proposed rule does not give the EPA new authorization or put into place new authorities.

Currently, the EPA is reviewing and considering comments received. The EPA will begin using administrative wage garnishment after the review of comments is completed, the proposed rule becomes final and following negotiations with the Department of Treasury on a memorandum of understanding, as the EPA has chosen for the Department of Treasury to conduct any administrative wage garnishment hearings on the EPA's behalf. When the EPA begins using administrative wage garnishment, the Department of Treasury will send a wage garnishment notice to the debtor. A debtor may request a hearing from the Department of Treasury concerning the existence or amount of the debt, or the terms of the proposed repayment schedule under the administrative wage garnishment order.

Administrative wage garnishment is only one of a suite of debt collection tools used by federal agencies to collect delinquent non-tax debt. Our proposed rule will make available this tool to the EPA, so the EPA can join with other federal agencies in ensuring that non-tax delinquent debts are recovered for appropriate public use.

Again, thank you for your letter. If you have further questions, please contact me or your staff may contact Christina Moody in the EPA's Office of Congressional and Intergovernmental Relations at (202) 564-0260.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. Bloom', is written over a horizontal line.

David A. Bloom
Acting Chief Financial Officer

AL-15-000-2681

RON WYDEN
OREGON

723 CLARKSEN SENATE OFFICE BUILDING
WASHINGTON, DC 20510
(202) 224-1244
(202) 224-1280 (TDD)

United States Senate
WASHINGTON, DC 20510-3703

COMMITTEES:

COMMITTEE ON THE BUDGET
COMMITTEE ON ENERGY AND NATURAL RESOURCES
SUBCOMMITTEE ON PUBLIC LANDS AND FORESTS
SPECIAL COMMITTEE ON AGING
SELECT COMMITTEE ON INTELLIGENCE
COMMITTEE ON FINANCE

November 19, 2014

Laura Vaught
Associate Administrator for Congressional
and Intergovernmental Relations
Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Room 3426 ARN
Washington, DC 20460

Dear Ms. Vaught:

Enclosed please find correspondence I received from a constituent. She reached out to your office about an issue she is having with the EPA's proposed wage garnishment rule.

I would greatly appreciate your addressing my constituent's concerns and responding directly to her. Please also send a copy to my Washington D.C. office, attention Malcolm McGeary, as I am interested in your response. Thank you in advance for your assistance.

Sincerely,



Ron Wyden
United States Senator

1720 SW 3RD AVE.
SUITE 585
PORTLAND, OR 97204
(503) 326-7525

405 EAST 8TH AVE.
SUITE 2020
EUGENE, OR 97401
(541) 441-6229

SAC ANNEX BUILDING
165 OR ST.
SUITE 201
LA GRANDE, OR 97850
(541) 962-7591

U.S. COURTHOUSE
310 WEST 6TH ST.
ROOM 118
MULFORD, OR 97501
(541) 858-5177

THE JAMISON BUILDING
131 NW HAWTHORNE AVE.
SUITE 107
BEND, OR 97701
(541) 330-9141

707 1/2TH ST SE
SUITE 285
SALEM, OR 97301
(503) 389-4555

Constituent

Exempt 6
Exempt 6

Exempt 6

Web Mail Message

Web Mail Subject: Environment (Clean Air, Clean Water, Waste)

Dear Senator Ron Wyden,
Dear Senator Wyden,

I wish to express my opposition to EPA Direct Final Rule Garnishment FRL 9910 14 OFCO: Administrative Wage Garnishment by EPA Note: This Final Rule will go into effect on September 2, 2014 unless adverse comments are received by August 1st. (See end of article)

In regard to the EPA proposed regulation to garnish wages without first obtaining a court order, I strongly oppose this blatant constitutional overreach by the agency and register my clear adverse position to it. I further request that the EPA withdraw its direct final rule from consideration now and forever.

This latest attempt exacerbates the already intolerable expansion of the EPA's regulatory abuses against individual Americans. It would give them unrestrained ability to not only arbitrarily make unfounded regulations, impose unwarranted penalties and fines, but then garnish the wages of the victim citizen rendering them unable to stand up to this oppression, and seek justice in a court of law. This is not tolerable!

No unelected bureaucracy should ever have this much unrestricted power to unleash on the citizens of this country as they so choose without due process.

Examples of excessive fines and abuse of power abounds in the EPA:

1. A West Virginia farmer, Exempt 6 was threatened with fines of up to \$37,500 per day because storm water which flowed across her property and into a "water of the United States" had come into contact with dust, feathers, and small amounts of manure located on the ground.
2. Exempt 6 of Wyoming was threatened with fines of as much as \$187,500.00 per day for building a pond on his private property.
3. In 2005, the Exempt 6 of northern Idaho had all the required local building permits for their new home on a .63 acre lot in an already developed subdivision. Federal officials suddenly demanded that they stop construction. The Agency claimed that the small lot was a "wetland," and was protected under the Clean Water Act. They were ordered to "put the land back the way it was, removing fill and replanting the vegetation they had cleared." The EPA required them to submit annual reports about the condition of the lot, and threatened to fine them \$32,500 a day until they complied.

"Each year the EPA issues up to 3,000 "administrative compliance orders" to businesses and individuals, demanding an end to alleged environmental violations and applying enough pressure that those who are accused typically give in before the agency has to justify the action before a judge."

Individuals and businesses are not their only targets. The EPA continues to wield its heavy hand against cities and other local government entities. A prime example of this is the excessive requirements imposed on city wastewater plants—Vacaville and Dixon for starters.

These requirements are "even by the EPA's own admission, not scientifically proven—they are at best, a guess." And by the way, the cost of meeting these unscientifically estimated requirements is to be of "NO Consideration." To put it plainly, it doesn't matter what it costs the taxpayer, "just do it, and send them the

bill." Again, cities are faced with daily fines of staggering proportions if they don't comply.

Is this your idea of AMERICA, or is this the Chicago way? None of these bureaucrats are elected officials.
"Welfare for the masses is the alibi of tyrants" - Albert Camus.

Sincerely,

A handwritten signature in black ink, appearing to be "L. Bryant 6".



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN - 5 2015

OFFICE OF THE
CHIEF FINANCIAL OFFICER

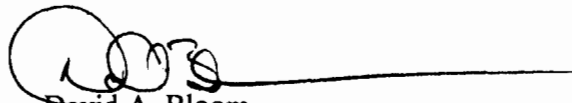
The Honorable Ron Wyden
Attention: Malcolm McGearry
United States Senate
Washington, DC 20510

Dear Senator Wyden:

Thank you for your letter of November 19, 2014, to the U.S. Environmental Protection Agency's Office of Congressional and Intergovernmental Relations. I appreciate this opportunity to clarify for your constituent, *exempt b*, the EPA's direct final rule, "Administrative Wage Garnishment," which the EPA published in the Federal Register on July 2, 2014, at 79 FR 37644. Enclosed is a copy of our response sent to your constituent.

Again, thank you for your letter. If you have further questions, please contact me or your staff may contact James Blizzard in the EPA's Office of Congressional and Intergovernmental Relations at (202) 564-1695.

Sincerely,



David A. Bloom
Acting Chief Financial Officer

Enclosure

1421 LONGWORTH BUILDING
WASHINGTON, DC 20515
202-225-5261
202-225-3719 FAX



TIM RYAN
CONGRESS OF THE UNITED STATES
13TH DISTRICT, OHIO

COMMITTEE ON APPROPRIATIONS
DEFENSE SUBCOMMITTEE
TRANSPORTATION, HOUSING, AND URBAN
DEVELOPMENT SUBCOMMITTEE

COMMITTEE ON THE BUDGET

November 13, 2014

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Administrator McCarthy:

It has come to my attention that the Ohio Department of Natural Resources (ODNR) has asked EPA for ODNR's Risk Based Data Management System and Emergency Response website to serve as the sole recipient of reporting of hazardous chemical inventory used by the oil and gas industry. I have serious concerns with this request being granted and the potential public safety ramifications that could result from pre-empting direct communication with the State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), or the respective local fire departments.

As you know, and as I have written to the EPA previously about, we have had serious gaps in regulatory oversight with regard to multiple aspects of oil and gas development and waste disposal in Ohio. While the State of Ohio and ODNR have taken post-incident steps to update regulations and implement appropriate moratoriums, with each subsequent incident it becomes clear that the necessary preparation and oversight is not at a level that will keep the public and environment safe. I realize that under the current statutory structure, much of the direct control and enforcement of regulations falls upon the state, however this is one instance where the EPA can have a direct impact on the direction we move with regard to public safety.

The reporting of hazardous chemical inventory information by the oil and gas (and fracking industry) to state and local emergency planners and first responders actually ceased in 2001 and has only just begun again as a result of an intervention by the US EPA Region V. In violation of federal law, the Ohio legislature gave ODNR the authority to be the only agency to receive all EPCRA inventory reporting information from the oil and gas industry. During this hiatus, which was never ratified by U.S. EPA, ODNR took no steps to set up the database and thus, displayed no sense of priority for EPCRA's important public safety goals.

Just this past June, we suffered a major incident at a shale gas well site in Monroe County. Twenty chemical trucks caught on fire and burned, forcing the evacuation of 25 households. The resultant chemical spill combined with the chemical-laden water used to put out the fire poured toxic fluid into Opossum Creek, a tributary of the Ohio River, killing over 70,000 fish along a

197 WEST MARKET STREET
WARREN, OH 44481
330-373-0074
330-373-0098 FAX

241 FEDERAL PLAZA WEST
YOUNGSTOWN, OH 44503
330-740-0193
330-740-0182 FAX

1030 EAST TALLMADGE AVENUE
AKRON, OH 44310
330-630-7311
330-630-7314 FAX

TOLL-FREE: 1-800-856-4152
WWW.HOUSE.GOV/TIMRYAN

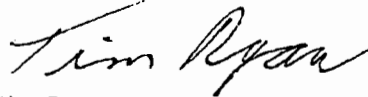


five mile stretch of the Creek and posing a potential risk to drinking water supplies. The rural and remote nature of the site led to extreme difficulty in addressing the fire, which remained burning for nearly a week before being fully extinguished. After the incident, EPA's own reports revealed that ODNR did not request full information on trade secret-protected chemicals until two days after the incident and did not share this information with other state or federal emergency response agencies.

This incident crystalizes the critical nature of adequate oversight and planning when there is the potential for these kinds of environmental disasters. We need to make sure first responders are prepared if an incident takes place, as most hydraulic fracturing sites in Ohio are in rural parts of the State with limited infrastructure and access to major roads and State resources. ODNR's actions in the wake of the Monroe County fire, as well as previous incidents involving injection well misuse and waste disposal, have deteriorated the public trust in an agency with so much autonomy in regulating the oil and gas development in the State. The bottom line is this: It is absolutely unacceptable for the SERC, the LEPC, and all first responder agencies to not have full access to the chemical inventory of each hydraulic fracturing site. Any action to move away from full chemical inventory reporting to SERC is an affront to environmental and public health. If EPA grants this authority, it could effectively eliminate the ability of first responders and related agencies to have in hand the critical information needed to best respond to any and all hydraulic fracturing incidents.

I ask that you reject ODNR's request to be the sole recipient of chemical inventory reporting, and implore the EPA to utilize its authority to make sure the State of Ohio continues to improve oversight and disaster mitigation. Thank you for your consideration and I look forward to your response.

Sincerely,



Tim Ryan
Member of Congress



Congressman Tim Ryan

Representing Ohio's Thirteenth Congressional District

FAX TRANSMISSION

To: EPA Administrator Gina McCarthy
 Phone: _____ Fax: 202-501-1450
 Date: 11/13/14 Number of Pages: 3
 Re: _____

From:

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Rep. Tim Ryan | <input type="checkbox"/> Debbie Hayes (Warren) | <input type="checkbox"/> Pat Lowry (Y-town) |
| <input type="checkbox"/> Mark Callion (Warren) | <input type="checkbox"/> Erin Isenberg (DC) | <input type="checkbox"/> Anne Sokolov (DC) |
| <input type="checkbox"/> Gene Crockett (Warren) | <input type="checkbox"/> Michael Julian (DC) | <input type="checkbox"/> Matthew Vadas (Warren) |
| <input type="checkbox"/> Catey Breck (Akron) | <input type="checkbox"/> Ryan Keating (DC) | <input type="checkbox"/> Pearlette Wigley (Y-town) |
| <input type="checkbox"/> Ron Grimes (DC) | <input type="checkbox"/> Rick Leonard (Warren) | <input type="checkbox"/> Michael Zetts (DC) |
| <input type="checkbox"/> Crystal Price (DC) | | |

Comments:

Washington, D.C.: 1421 Longworth House Office Building Washington, D.C. 20515 Phone: (202) 225-5261 Fax: (202) 225-3719	Warren: 197 W. Market St. Warren, OH 44481 Phone: (330) 373-0074 Fax: (330) 373-0098 Toll-Free: 1-800-856-4152
Youngstown: 241 Federal Plaza West Youngstown, OH 44503 Phone: (330) 740-0193 Fax: (330) 740-0182	Akron: 1030 E. Tallmadge Ave. Akron, OH 44310 Phone: (330) 630-7311 Fax: (330) 630-7314



United States Environmental Protection Agency
Regional Administrator
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

DEC 22 2014

The Honorable Tim Ryan
House of Representatives
Washington, D.C. 20515

Dear Congressman Ryan:

Thank you for your November 13, 2014 letter requesting that the U.S. Environmental Protection Agency reject an Ohio Department of Natural Resources "request to be the sole recipient of chemical inventory reporting" under the federal Emergency Planning and Community Right-to-Know-Act (EPCRA).

EPA has not received such a request from ODNR and does not grant approval for state EPCRA compliance programs. EPCRA Sections 311 and 312 require facilities to provide information on hazardous chemicals to the State Emergency Response Commission, Local Emergency Planning Committee and the local fire department. EPA encourages these entities, as well as other state and local agencies, to work together to implement all EPCRA provisions -- including reporting requirements under EPCRA Sections 311 and 312. EPA has provided guidance to states on various reporting options. Implementing agencies may choose any of the options EPA has suggested or implement a different reporting procedure, as long as it meets EPCRA requirements and implementing regulations.

Again, thank you for your letter. If you have further questions, please contact me or your staff may contact Ronna Beckmann or Eileen Deamer, the Region 5 Congressional Liaisons, at (312) 886-3000.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Hedman", is written over a horizontal line.

Susan Hedman
Regional Administrator